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Battery Charging Cabinet

In this plan you will be getting:

- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.



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Battery Charging Cabinet

If you've got more cordless tool chargers than outlets, keeping all your batteries charged and organized can be a problem. This compact charging cabinet stows multiple chargers and batteries neatly, and the contents hide away behind a tambour door that's easy to build. A weekend of shop time is all it takes to turn charger clutter into an efficient charging system—and it's a fitting way to learn tambour door construction, too.

If you're one of those woodworkers who wholeheartedly believes that "he who dies with the most tools, wins" then chances are, your shop has more portable power tools in it than you can count on both your hands...and feet. And if you're a thoroughly modern woodworker, chances are good that an ever-growing number of those portables are of the cordless variety.

The downside to having all this high-tech hardware on hand is that you're likely to have tools made by three or four different manufacturers, each of which requires separate, dedicated batteries—and battery chargers. It's all too easy to end up with a half dozen chargers and

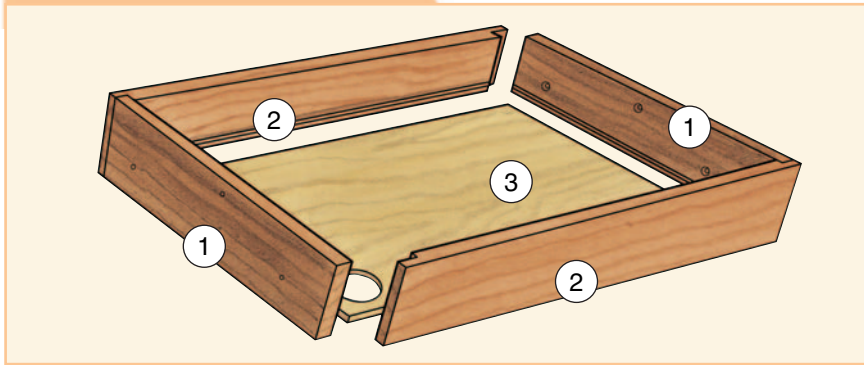
extra batteries sprawled out across your benchtop.

Our solution to keeping a gaggle of different battery chargers organized, neatly stored and plugged in is to build a wall-hung cabinet especially for them. This charger cabinet has four trays that accommodate six or more battery chargers, as well as a handful of spare batteries and accessories. Each tray is wide enough to handle any of the battery chargers currently on the U.S. market and is angled forward, to make it easier to plug in or remove batteries. Charger cords run neatly through the bottom of the trays along the sides of the cabinet to a multi-outlet powerstrip, which is screwed to the bottom of the cabinet. A tambour-style door encloses the entire interior of the cabinet, to keep dust and chips from fouling battery contacts or sensitive charger electronics.

The cabinet is designed to mount directly to your shop's 16" on-center wall studs. It's slender and tall, to



Tray Exploded View



fit the narrowest spot and save on wall space.

The intent from the start was to create a good-looking cabinet from hardwood but keep the design easy to build. We assembled the trays using simple, but strong, rabbet joints and a captured bottom, then screwed the trays to the cabinet sides using wood screws. We also used an unorthodox shortcut method for making the tambour door and the grooved track it slides in without painstaking work or elaborate jigs. Although these construction

methods may be called “quick and dirty” by purists, they are aimed at producing a strong, functional piece of shop cabinetry that looks terrific and doesn’t take a week to build.

Relatively few parts are needed for the charger cabinet, as you can see in the *Material List* on page 18. There are two solid-wood cabinet sides, each with a grooved track for the tambour door (routed using a special router fence setup), four trays with solid-wood sides and plywood bottoms, a narrow bottom rail that joins the cabinet sides



Use your drill press to drill and counter-bore holes in the tray sides. Placement isn't critical, but use your first side as a template for drilling the others for a uniform appearance.

and supports a powerstrip and a tambour door. The door consists of 59 narrow wood slats held together by a canvas backing glued and ironed into place as the tambour is held and aligned in a simple shop-made jig.

Start the cabinet project by cutting and assembling the parts for the four identical trays (pieces 1 through 3). The trays serve as the major structural elements that support and align the sides of the cabinet. Cut the solid-wood components to size, making sure all the long sides are exactly the same length, as any variation will negatively affect the way the tambour door slides.

To capture the plywood bottom of each tray, cut a groove along the inside of each side, positioned as shown in the *drawing* on the top of page 18. Next, cut out the four plywood bottoms and take them to the drill press. Using a Forstner bit or hole saw, bore two 1¼" diameter holes in each bottom, positioned as shown in the *drawings*.



Setting up for repeatable cuts is critical for the trays in this project, as they also serve as structural elements in the cabinet. You can add a little strength to the glued-up corners (right) with several thin brads.





Use a sharp carpenter's pencil and a bevel gauge set to 70° to mark out where the tray bottoms meet the cabinet sides.

These holes accommodate the plugs on the charger cords. As long as you're at the drill press, go ahead and bore three holes in each of the tray's short sides (see *drawings*) for the flathead screws that attach the trays to the sides. Since placement isn't critical, mark out hole positions on one side, then use it as a template to drill the other sides, as shown in the *photo* on the facing page. Countersink the holes (on the inside-facing surfaces) for the screws.

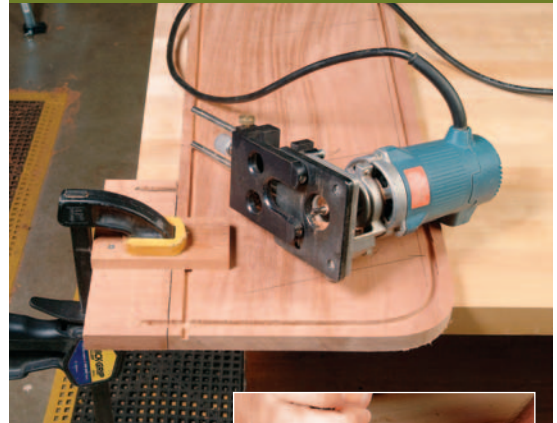
To create a strong, simple joint that joins the tray sides, cut a rabbet on each end of each long side piece, using a dado blade in the table saw. A miter fence with a built-in stop helps to keep the work dependably square and in position as it's cut, as shown in the bottom *photo* on the facing page. Or, use your miter saw for these cuts.

After sanding the inside surfaces of the tray sides and ply bottoms, glue and clamp them together. It is important to make sure at this stage that none of the tray pieces are twisted. After clamping, check each

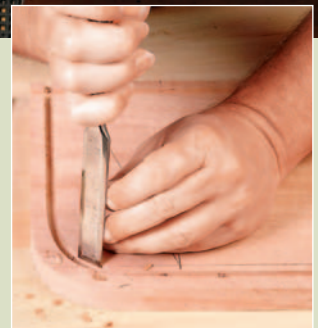


Use a disc sander to smooth the corners of the sides to the marked radii. The goal is to end up with three 1/4-round, identical corners on each cabinet side.

PRECISION TRACKING



Make a runoff block with 3/4" x 1 1/2" x 8"-wide scrap wood and screw on a 2" x 4"-long cross-piece at 90°, as shown above. When you've routed the track, use a chisel to create a bit more relief space at the corners.



This tambour track routing method doesn't require a routing template or a rub collar. Instead, we used MicroFence's two-point-contact router fence, which rides against the edge of the cabinet side. The contact points guide the cut at a fixed distance from the edge, even around rounded corners. The trick is that the shape of the side's edge determines the shape of the routed track.

As such, the cabinet must have two rounded top corners and another at the bottom rear. This provides the curved track for the tambour when the door is opened all the way. It takes some skill to guide a two-point fence around a corner, so practice on scrap first.

You could make your own fence for this job, but MicroFence's router fence makes this sort of groove routing really easy. This is because the MicroFence comes with two semi-circular guides that mount in place of its normal straight fence bar, making it just right for our track routing method. If you decide to make or adapt your own two-point fence, be sure the two rounded lobes have 1" radii and are set on center, 2" apart.

Cabinet Exploded View

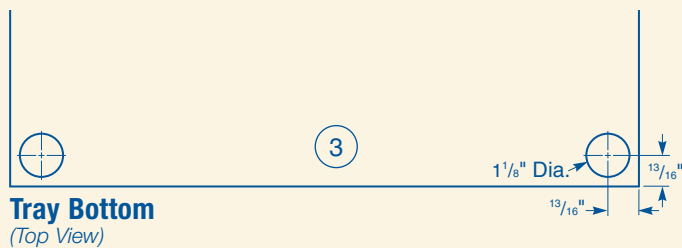
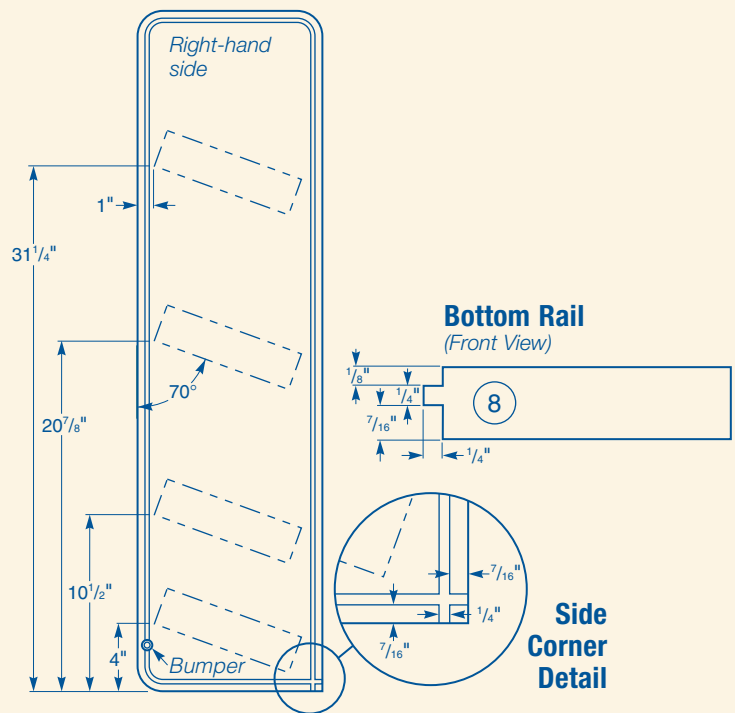


MATERIAL LIST – Cabinet

	T x W x L
1 Tray Sides (8)	1/2" x 2 1/4" x 8"
2 Tray Fronts and Backs (8)	1/2" x 2 1/4" x 17"
3 Tray Bottoms (4)	1/4" x 7 15/16" x 16 3/8"
4 Cabinet Sides (2)	3/4" x 11" x 40 1/2"
5 Tambour Slat Blanks* (64)	5/16" x 13/16" x 17 1/2"
6 Tambour Backing (1)	1 yard, 10 oz. cotton duck
7 Door Pull (1)	13/16" x 1 1/8" x 16 3/4"
8 Bottom Rail (1)	13/16" x 2 1/2" x 17 1/2"
9 Bumper Stops (2)	Screwed-on rubber

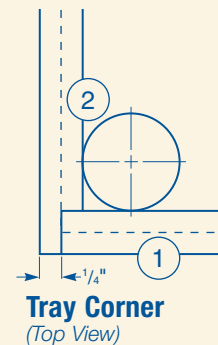
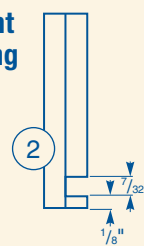
*Trim to fit after door is glued up; cut extra slats to select from

Cabinet Sides (Side View)



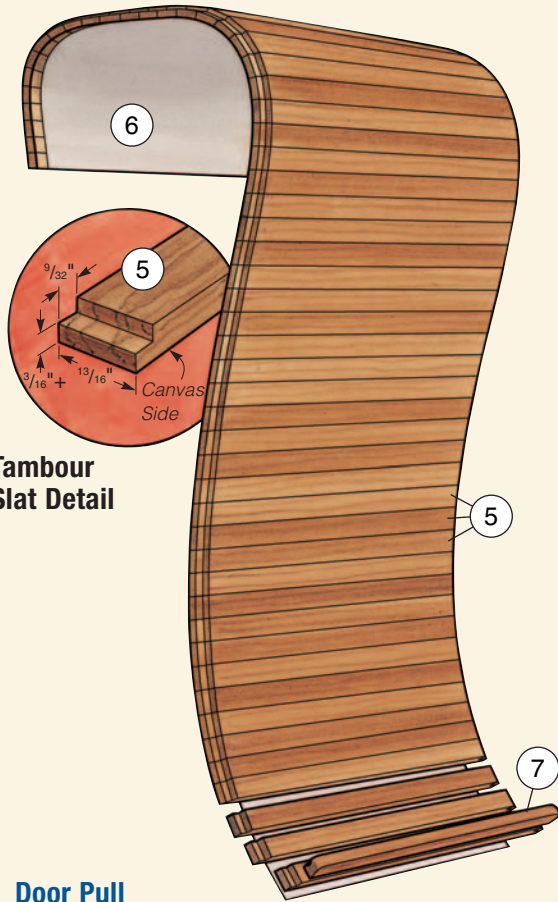
Tray Bottom
(Top View)

Tray Front Machining Detail (End View)



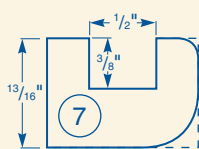
Tray Corner
(Top View)

Tambour Door Exploded View

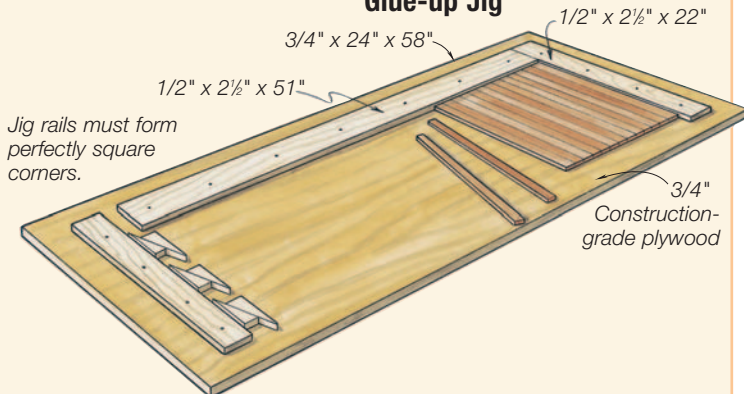


Tambour Slat Detail

Door Pull (End View)



Tambour Slat Glue-up Jig



CREATING TAMBOUR SLATS



Use a band saw to rip the thin tambour slats from a thick blank. Choose the best-looking slats for your door.



Making this tambour door requires about 59 slats (pieces 5). Select wide, 13/16"-thick lumber with a clean, evenly planed surface. Crosscut your blanks 17 1/2" long and perfectly square with edges jointed square and parallel to one another. You'll need enough stock to yield about 64 slats (a few extra to choose from). It helps to cut the slats on a band saw, since the blade's thin kerf wastes less wood. Set the rip fence to cut strips 11/32" thick. Rip slats from the edges of the blanks you prepare.

When all your blanks have their edges cut once, clean up their edges on the jointer and rip another set of slats. After repeating this process a few times, check to make sure the edges of all blanks are still parallel.

Once all the slats are cut, it's time to run them through your thickness planer once (paying close attention to grain direction), shaving down the rough side. This should produce a big stack of slats each 5/16" thick, with two clean and parallel surfaces.

TAMBOUR ALIGNMENT JIG



Use wedges to hold and align the slats in your jig. Tamp the slats flat with a hammer and block (right), then re-tighten the wedges.



Once the slats are set in the jig “good-side-down,” you’re ready to apply the lightweight (10-oz.) canvas cotton duck (piece 6). Don’t cut it to exact size yet, just trim one long edge straight with a razor blade and straightedge.

We used an iron to quick-cure the glue. Fully heat it to “high” before you start. Quickly apply a thin layer of PVA glue to one face of the canvas and slats (see the sidebar on the next page).

Place the canvas on the slats, aligning the trimmed edge with the long stop of the jig (if the glue is starting to dry, don’t worry; the iron’s heat will reactivate it). Without dawdling, iron the entire surface of the canvas with large, back and forth sweeping passes. It will only take a minute or so to cure the glue. Remove the glued-up tambour from the jig right away, and flex it to be sure the joints between slats move freely. If adjacent slats are stuck together, clean them with a damp rag. Knock off the slats’ sharp edges with some 120-grit paper.

Trim the canvas using a sharp razor and straightedge. Cut it back 3/8" on each long side of the door and flush to the edges of slats at each end.

tray for square by measuring diagonally, from corner to corner.

After the glue has set and the clamps are off, reinforce the corners by driving a few 1"-long brads into each end, as shown in the inset photo on page 18.

The two sides of the cabinet (pieces 4) are made from 4/4 wood thickness-planed down to 3/4". Take care to make sure each end is square. After picking the “good” face of each cabinet side, lay them both good-face-down on your bench, edges aligned. Draw a line 1" in from the back edge of each side and, using the dimensions in the *Cabinet Side View Drawings* on page 18, measure out and mark the bottom, back corner position of each tray. Then, using a bevel gauge set to 70°, mark a fine line with a carpenter’s pencil where the bottom edge of each of the trays will go (see the photo on page 17). The pencil indents the wood so you can still see lines after the sides are sanded. Label their front and top edges, so you don’t rout the wrong surfaces.

Clamp the two cabinet sides together with their inside faces facing in, using three or four clamps positioned well away from the ends. Set a pencil compass to a 3" radius and mark a quarter circle at the two top corners and at the single bottom rear corner. Now rough-cut the corners just shy of the pencil line. With the sides still clamped together, use a disc sander to smooth all three corners down to the marked radius.

Routing the Tambour Track

A narrow groove routed around the edges of both sides, as shown in the *Cabinet Side View Drawings*, page 18, creates a track to guide the tambour door. The method we used to rout this



To begin assembling the cabinet, align the trays on the marks you scribed earlier and secure them with screws. The trays are the structural members that join the cabinet sides and hold them square.

track requires a special router fence setup, as described in the sidebar on page 17. To provide a surface for the fence’s guide to ride on where the groove enters and exits the end of each side, you’ll need a runout block. This block is clamped to the end and front edge before routing at those locations.

The tambour track is routed with a 1/4"-diameter straight bit. You can use a fixed-base or plunge router, but a laminate trimmer is easier to maneuver than a full-size router. Rout the track in three passes, each successively deeper. Move the router carefully around the corners, using constant and full pressure to keep the edge guide always against the edge of the work. Don’t worry if you make a slight goof, because most of the length of the track itself is hidden by the tambour, and small divots won’t affect its operation too much.

Once the track routing is complete, use a chisel to widen the inside radius of the grooves at each of the track corners. This adds a little relief and allows the tambour to negotiate the



With the cabinet assembled, gently slide the tambour door into its track. This step will require a bit of patience and care, since even slight racking or one misaligned slat can hang things up. If the door sticks, slide it back a nudge and try again.

corners more easily. Sand the track grooves smooth along their entire length, using either a foam-backed sanding pad or a short strip of 120-grit sandpaper wrapped around a small piece of stiff foam. For areas that fuzzed up or splintered during routing, start with coarser, 80-grit sandpaper. All surfaces of the track groove should end up very smooth, with their top edges slightly rounded.

One result of this track-routing method you may have noticed is that the radius of the routed track is slightly less than that of the corner itself. To make them match, clamp the cabinet sides together again as you did before, and sand the top corners down to a radius of $3\frac{1}{4}$ ". The bottom corner won't show so you can leave it alone.

To complete the cabinet sides, round their top and front-facing outer edges with a $\frac{1}{4}$ "-radius piloted roundover bit. Don't rout the straight portion of the back or the bottom edges, as these should stay square for attaching the bottom rail and mounting the cabinet to the wall. Finally, sand the

routed edges and inside faces of the cabinet sides smooth.

Turn your attention to page 19 and the *sidebars* throughout this article to build the tambour door (pieces 5 and 6). Once you've completed all the steps, you'll still have to make and install a U-shaped pull (piece 7) from solid wood. (See the *Door Pull Elevation Drawing* on page 19.) Cut the $\frac{3}{8}$ "-deep channel in the underside of the pull with a $\frac{1}{2}$ "-wide dado blade in the table saw. After rounding or beveling its ends with a rasp or stationary sander, glue the pull to the end slat at the bottom of the door. When the glue sets, nail through this slat to further secure the pull.

The next step is to assemble the cabinet and do a trial fitting of the tambour in its track. With one of the cabinet sides on the benchtop, carefully position the bottom edge and back corner of each tray, following the lines marked earlier. Drive in the three #8 x 1" screws that attach each end of each tray to the side, as shown in the top *photo* on the facing page. Once all

GLUING THE SLATS TO THE CANVAS



Quickly apply a thin layer of glue (yellow or white woodworking glues work equally well) to one side of the canvas and then the slats. (This takes quite a bit of glue.)



Place the canvas on the slats, aligning the trimmed long edge to the long stop of the jig (don't worry if the glue starts to dry; ironing will reactivate it). Press the canvas flat using a round-edged block of wood.



Quick-set the glue with a hot iron. After the glue has cured,



cut the canvas back $\frac{3}{8}$ " on each long side of the tambour. Cut it flush to the edges of slats at each end. If the canvas starts to lift, apply a dab of glue and stick it back down, ironing it as necessary.

FINAL TRIMMING DETAILS



Roll out the tambour as you trim it on the table saw. Then create “tongues” on the ends of the slats by forming a rabbet with a dado blade (inset).



With the tambour glued up, it's time to trim the door to its final 17 $\frac{1}{2}$ " width, using a table saw and crosscut blade. Start with the canvas side up, positioning the edge that was butted up to the long stop in the jig against the saw's rip fence. Next, rabbet the slats to create a wood “tongue” on each end. This makes it easier for the door to negotiate the corners of the track. Fit the table saw with a dado blade that's at least 5/16" wide and set its height to produce a tongue that's just a skosh over 3/16" thick (see the Tambour Detail Drawing, on page 19). Set the rip fence to produce 9/32" long tongues on each side of the tambour. With the canvas side up, carefully feed the tambour over the blade, using a push block to keep it flat and ensure a full depth of cut. It's easiest to unroll the tambour as you feed it through the cut, then roll it back up again at the back of the saw. Sand all surfaces of the tongues to round their edges slightly, to help it slide easier. Roll the tambour up and sand the slats with the outer corners of each tongue exposed.

the trays are attached, carefully flip the assembly over and set it atop the other cabinet side, and finish screwing on the trays to join the sides together.

With the cabinet lying on its back, gently insert the tambour into its groove at the bottom edge. Work it slowly up the front and all the way around the track to the back (see top *photo*, page 21), pulling it back and forth to wear it in slightly. If the tambour hangs up in the corners, check to see if any of the tongues or sections of the groove need a little more trimming or sanding. Stay with it until the tambour slides all the way around the track without too much effort.

Finishing Up

When you're finally pleased with how the tambour fits into the cabinet, remove it from its track. You're just about ready for finishing. But first, make the bottom rail (piece 8) that joins the cabinet sides and provides a place to mount the electrical power strip (see the *Elevation Drawings* on page 18 for details). Using a dado blade in your table saw, cut the short tongues that fit into the track grooves. Check the rail for a snug fit, but don't install it just yet.

A wipe-on finish such as satin polyurethane gel makes a good finish for this project. Spread finish over the surfaces of the assembled cabinet, the good side of the tambour door and the bottom rail, then wipe the excess off. Wipe finish on and off the edges of all the tambour slats, then leave the wet tambour door rolled up on its edge to dry without adjacent slats sticking together. After a few hours, do a quick touch-sanding with 320-grit sandpaper and apply a second coat of finish. The result is a serviceable finish that looks great on the outside of the cabinet, and okay on the inside—perfect for a shop project.

When the finish dries, apply a bit of paraffin or candle wax to the slat tongues as well as the tambour track all the way around. Reinstall the tambour and position the door pull at the top of the front track curve. Now screw on two rubber bumper stops (pieces 9) against the edge of the last slat and directly over the track groove. These keep the door from sliding too far open.

Drive the cabinet's bottom rail flush with the front of the cabinet, as shown in the *photo* on the left page. Then drive two #8 x 1 $\frac{1}{2}$ " screws into pilot holes drilled into each end to secure the rail. The screws let you remove the rail in the future, in case you need to adjust the tambour. Mount the power strip to the underside of the bottom rail with a pair of screws.

Mounting the Cabinet

Hang the cabinet by “toe-screwing” directly through each side into the wall studs. First, drill four holes spaced evenly along the straight portion of the back edge of each side, angling them at about 45°. Next, position the cabinet on the wall so that it straddles a pair of wall studs.

Support and level the cabinet, then drive the #8 x 2"-long bugle-head screws into the studs. If your walls lack properly spaced studs, screw a piece of plywood to the wall, and then mount your cabinet to it instead.

Now for the fun part: filling the cabinet's trays with your chargers and other gear. Feed each charger's electrical cord down through the holes in the bottom of the trays and plug them into the power strip. Wind up the excess cord and use wire or plastic ties to keep them neatly coiled. Plug the strip's cord into an outlet, and your tool batteries will always be juiced up and ready for action.



One of the last steps is to drive home the cabinet's bottom rail. A power strip is mounted to the rail. It provides electricity to all the battery chargers.

QuickTip

Egg-cellent Solution...

Egg cartons can form convenient bases to support knobs and such for painting or finishing. Punch a small hole in the base of each recess in one half of a carton, then screw the knobs in place. This way, the knobs stay put and separated for applying the finish, your hands end up cleaner and the carton forms a handy drying rack.

