

WOODWORKER'S JOURNAL

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Classic Project



In this plan you'll find:

- Step-by-step construction instruction.
- A complete bill of materials.
- Construction drawings and related photos.
- Tips to help you complete the project and become a better woodworker.



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Wall-Hung Ironing Board

Wall-Hung Ironing Board



Here's a handy project that lends an everyday object a decorative flair. The board is large enough to be used as a household's primary ironing surface. Yet the unit is compact enough to serve as a spare in the kitchen or bedroom. Wherever you decide to put it, the ironing board will wait unobtrusively in its case until needed.

We made our case parts from $\frac{3}{4}$ in. thick pine and the board itself from $\frac{1}{2}$ in. thick birch plywood. The plywood helps prevent warping, but you can substitute pine if you want. The choice of finish is open to interpretation. We finished it with Minwax Jacobean stain followed by two coats of Minwax Antique Oil Finish. You can paint the unit to match your decor, or even leave it unfinished if you plan to hang it in the utility room. We list a source for the ironing board cover in the Bill of Materials.

The project is a straightforward case piece employing a rabbet and dado for the joinery. There is no full-length back; screws through cleats (parts E and F) at the top and bottom hold the unit securely to the wall. For more on hanging cabinets see Woodworking Basics on page 17.

First, cut the stock to the sizes shown in the Bill of Materials. You'll save lumber if you cut from larger to smaller parts in sequence.

Then cut the dados and grooves in the sides (A). Use a $\frac{1}{2}$ in. diameter straight cutter in the router table, and set the bit $\frac{1}{2}$ in. high. For all these groove cuts you use essentially the same setup. The grooves for the cleats are stopped. The dados run across the width of the sides as shown.

Use the same setup to cut all the $\frac{1}{2}$ in. deep by $\frac{1}{2}$ in. wide rabbets: on the ends of the top and bottom (B), on the support shelf (C), and on the top and bottom cleats. Also notch the support shelf as shown.

With the joinery done, move to the details. Cut the heart using the full-size pattern we provide, and establish the profile for the spacer block (G) and ironing board (H). Also make the thumb latch (N) as shown. The step in the latch makes it easier to operate. Note that the heart profile is slightly chamfered on the inside.

Now dry assemble the case to make sure everything is square and the parts fit. If everything fits as it should, sand

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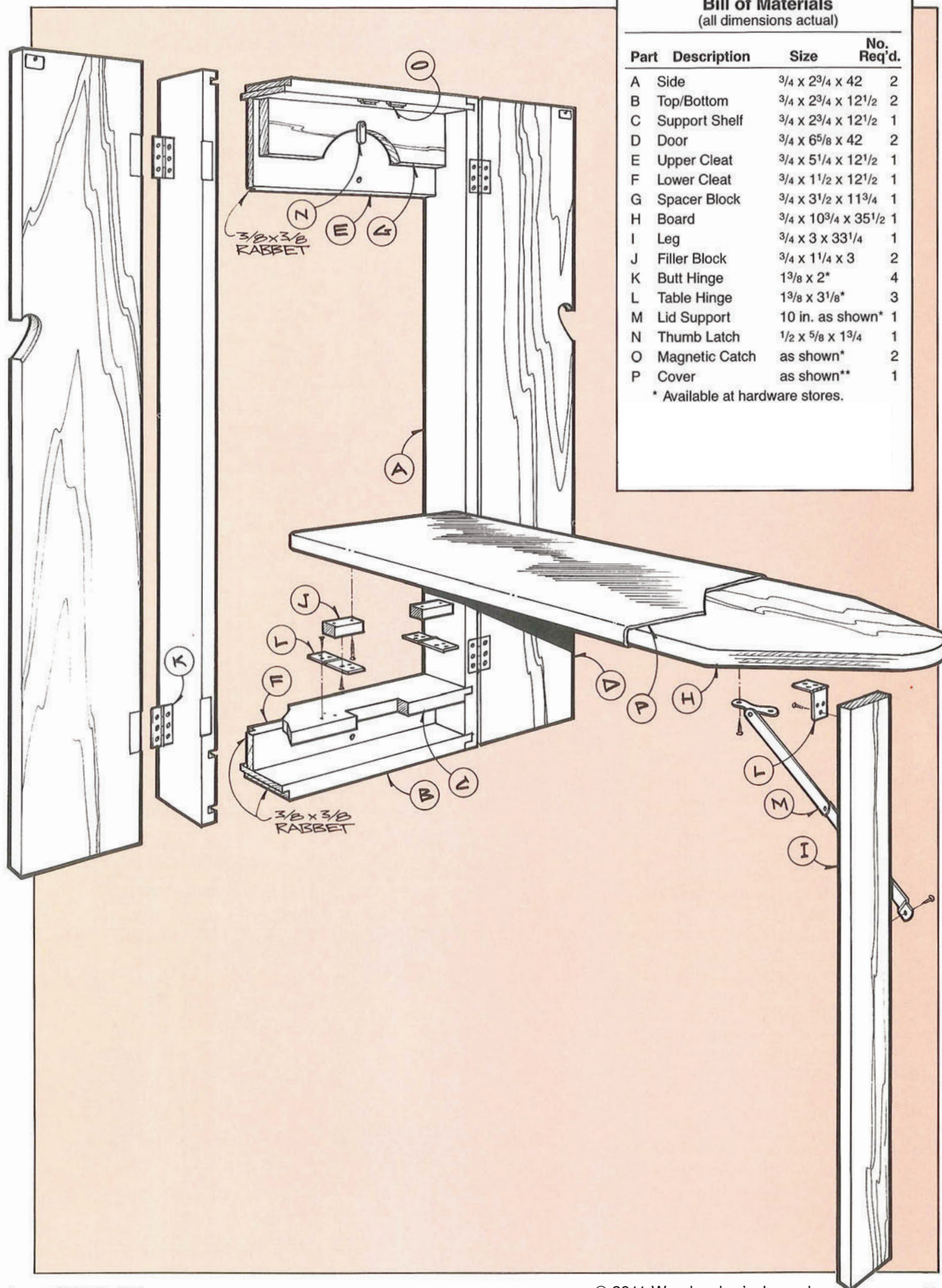
Then cut the dados and grooves in the sides (A). Use a $\frac{3}{8}$ in. diameter straight cutter in the router table, and set the bit $\frac{3}{8}$ in. high. For all these groove cuts you use essentially the same setup. The grooves for the cleats are stopped. The dados run across the width of the sides as shown.

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The Woodworker's Journal



Bill of Materials (all dimensions actual)


Part	Description	Size	No. Req'd.
A	Side	3/4 x 23/4 x 42	2
B	Top/Bottom	3/4 x 23/4 x 12 1/2	2
C	Support Shelf	3/4 x 23/4 x 12 1/2	1
D	Door	3/4 x 65/8 x 42	2
E	Upper Cleat	3/4 x 5 1/4 x 12 1/2	1
F	Lower Cleat	3/4 x 1 1/2 x 12 1/2	1
G	Spacer Block	3/4 x 3 1/2 x 11 3/4	1
H	Board	3/4 x 10 3/4 x 35 1/2	1
I	Leg	3/4 x 3 x 33 1/4	1
J	Filler Block	3/4 x 1 1/4 x 3	2
K	Butt Hinge	1 3/8 x 2*	4
L	Table Hinge	1 3/8 x 3 1/8*	3
M	Lid Support	10 in. as shown*	1
N	Thumb Latch	1/2 x 5/8 x 1 3/4	1
O	Magnetic Catch	as shown*	2
P	Cover	as shown**	1

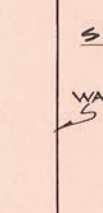
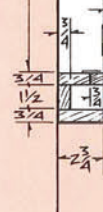
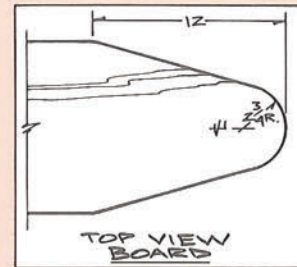
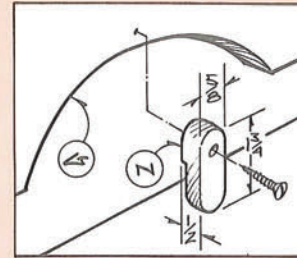
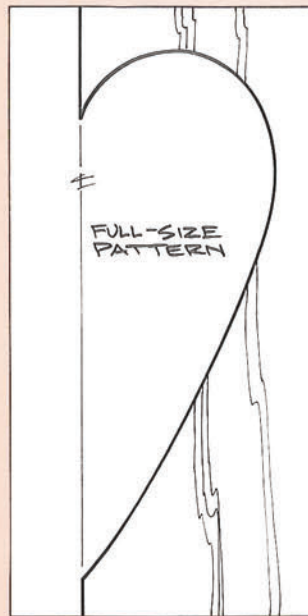
* Available at hardware stores.



the parts and assemble the case. Note that the spacer block is glued in place, but it's best to leave it off until the rest of the case is out of clamps.

With the case done, mortise for the butt hinges and hang the doors. Also install the filler blocks (J) and the three table hinges (L). Note that you should position the board inside the completed case to find the precise hinge locations, and that the hinges are oriented for maximum strength. For the bottom of the board, the short side of the hinge is screwed to the support shelf, and the long side of the hinge is screwed to the filler blocks, which are screwed to the bottom of the board. (A space between the filler blocks and the edge of the board allows you to wrap the cover around the board.) At the top of the board, the short leaf is screwed to the underside of the board. With the board attached, add the lid support (M), the magnetic catches (O), the leg (I) and the thumb latch.

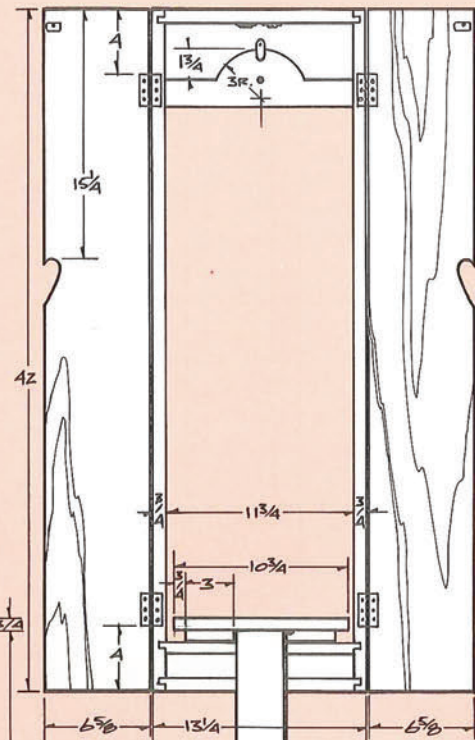
As noted, you can finish the piece as you choose using a clear coating or paint. It's best to leave the board itself unfinished, so the heat of the iron doesn't affect varnish or paint. The cover (P) goes on last. 



SECTION

WALL

FLOOR



FRONT VIEW



Woodworking Basics

How to Hang Wall Cabinets



The real fun in woodworking is in making projects. But the challenges often come from unexpected places. After long hours of work chopping out mortises and fitting tenons

on a fine wall cabinet, how to hang the cabinet might seem like child's play. But given a wall where the studs aren't in the right places, more than one woodworker has been stymied.

Of course, hanging a cabinet will be a different challenge for each new situation. If you've built the cabinet to mount on a concrete wall, then you'll use different hardware than for a sheetrock-over-stud wall. Knowing your hardware options and deciding what approach to take are the important considerations.

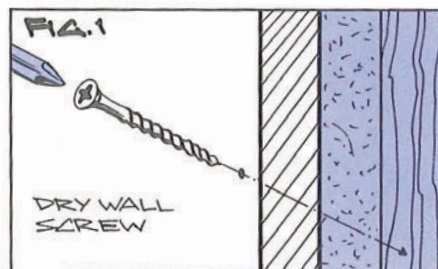
Although we've chosen the ubiquitous cabinet as the focus of this article, much of the hardware and techniques illustrated work as well on everything from flights of shelves to corner cupboards, clocks and mirrors.

Think First

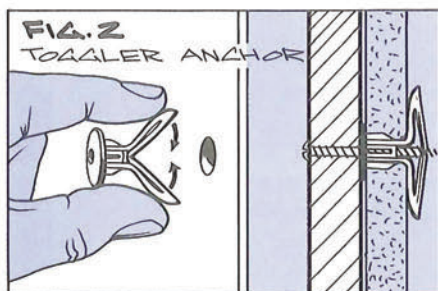
Thinking about how to hang a project before you actually build it saves headaches later on. If, for example, you have a simple cabinet with two sides, top, bottom, door and back, and plan to hang the cabinet on an area of the wall where it will span several studs, then the easiest way to hang the cabinet is by screwing through the back into the studs. The key consideration is to make the back sturdy enough, and to make sure it's securely attached to the cabinet. If the plans call for $\frac{1}{8}$ in. or $\frac{1}{4}$ in. plywood for the back, you should consider using $\frac{1}{2}$ in. thick plywood instead. The challenge is how to hang the cabinet where the cabinet back is only $\frac{1}{8}$ in. thick and there are no studs to screw into.

Commercial Hardware

Many cabinet-hanging problems can be resolved with the purchase of the proper hardware. There are many spe-



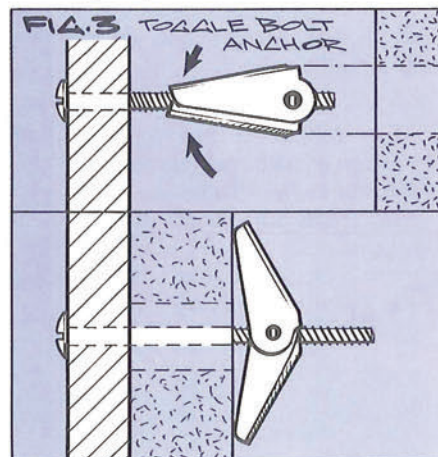
cialized devices for sale, but from a standpoint of simplicity, it's hard to beat the plain old screw. Only today there's one new wrinkle — be sure to buy dry-wall type screws (Fig. 1). They're available in a multitude of sizes and lengths, don't require a pilot hole, and can be driven effectively with a drill-



driver equipped with a Phillips bit. Since the drywall screw has a thin head profile, it pulls flush without need of a countersink, even in hardwood.

If you are faced with hanging a cabinet in a sheetrock wall where the studs aren't placed conveniently, then you'll need a hollow wall anchor. There are three basic types of hollow wall anchors. Plastic Toggler anchors (Fig. 2) actually work both in solid and hollow walls. The plastic wings spread apart as the screw is inserted. The screw provided usually isn't long enough if the item being mounted has much thickness however, so you may need to use a longer screw. These hangers are usually rated for medium-duty, at about 40 pounds of support on a wall.

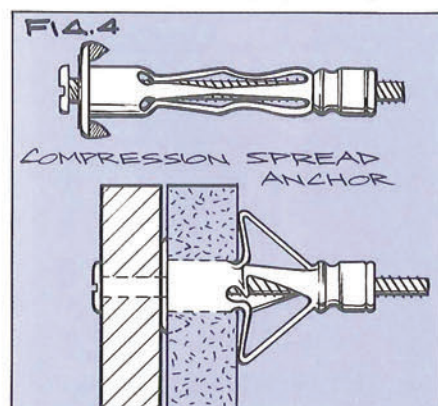
The traditional choice for a medium-to heavy-duty hollow wall anchor is the



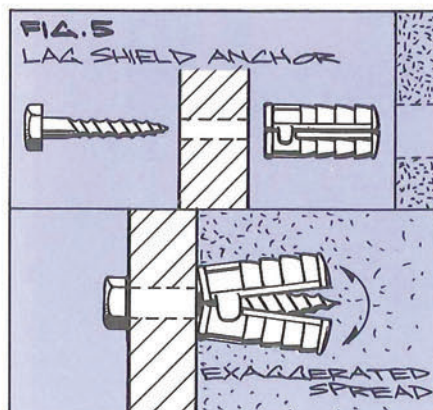
toggle bolt (Fig. 3). With the toggle bolt you just start the bolt on the nut in the toggle, drill an appropriately sized hole in the wall, and insert the toggle through the hole. The spring-loaded toggle wings fold up to fit through the hole, and then expand in the hollow. The bolt must be inserted through whatever's being hung before it's threaded into the

toggle nut, since there's no way to get the part to be hung mounted after the toggle is inserted.

The third hollow wall anchor in our list is the compression spread device shown in Fig. 4. These are medium-duty hangers. As illustrated, the hanger is inserted into a hole drilled in the wall, and the screw is then tightened with a screwdriver. The casing spreads apart to



lock the anchor onto the wall. The screw is then removed and reinserted through the cabinet back. The advantage of this type of hanger is that the object being hung can be removed without losing the anchor. Just be sure to purchase an anchor that's sized to the thickness of your wall. A chart on the back of this and most other wall hanger packages



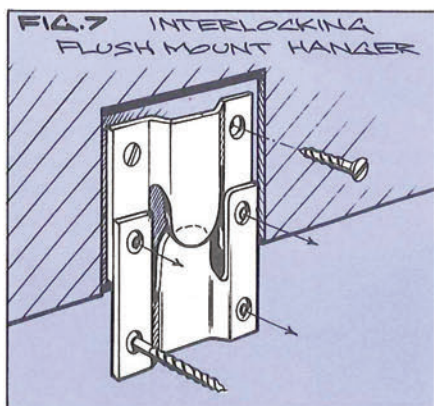
specifies what size anchor to use for a particular wall thickness, and what size hole to drill for that anchor.

If you're hanging a cabinet on a masonry, brick, concrete or stone wall that is solid (no hollow area), then you have two options, both similar. For the heaviest duty applications, use a metal-



jacketed lag shield (Fig. 5). Just drill the size hole as required for the size lag you're using and insert the lag shield into the hole so that it's flush with the wall. Then insert the lag screw through the item to be anchored and into the lag shield. As the bolt is tightened it spreads the two halves of the lag shield apart, locking the shield into the solid surface. Plastic-jacketed anchors (Fig. 6) work the same way, but they aren't quite as heavy duty.

If you are hanging a cabinet in an older plaster-over-lath wall, and you can't screw directly into studs, then the best approach is to use one of the hollow



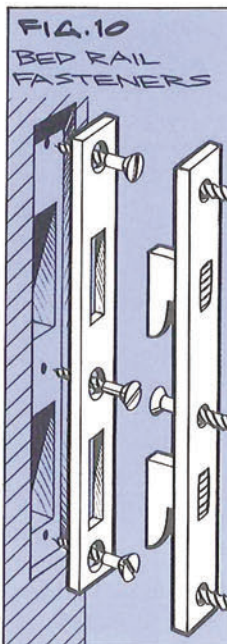
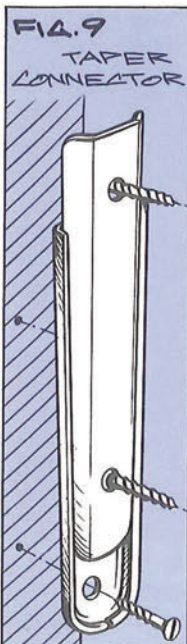
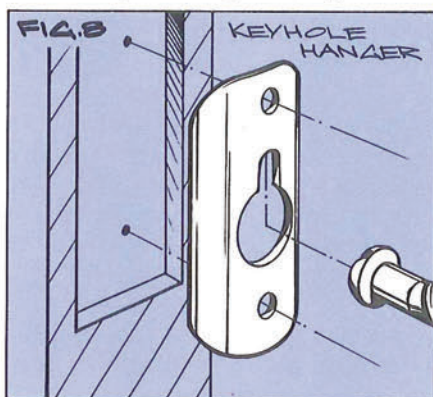
wall anchors. Since most plaster-over-lath walls are applied over studs, there's a hollow area between the studs. Just be sure to use screws long enough to penetrate through and into the hollow. Plastic-jacketed lags are an alternate choice, but they're not as strong and may eventually work loose.

Four other commercial hangers worth mentioning are interlocking flush-mount hangers (Fig. 7), keyhole hangers (Fig. 8), taper connectors (Fig. 9) and bed rail fasteners (Fig. 10). With flush mount hangers, one bracket mounts on the wall, while the other bracket is recessed into the back of the piece being hung. With keyhole hangers the keyhole bracket can either be mounted flush or mortised into the back of the piece. A roundhead screw inserted into the wall then slips into the

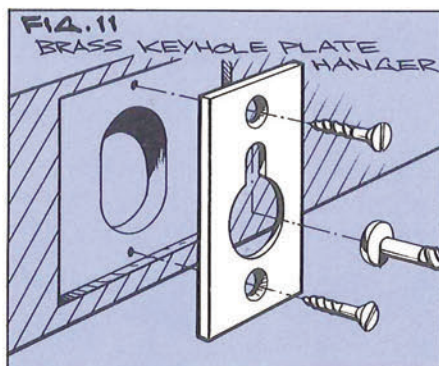
keyhole. If you need additional support, double keyhole fasteners are available.

Taper connectors and bed rail fasteners are ideal for extra heavy-duty jobs. With both of these hangers, one part of the connection mounts to the wall and the other to the piece being hung.

One other commercial hanger is a solid brass keyhole plate (Fig. 11). These hangers are flat instead of raised like the keyhole hangers in Fig. 8, so in



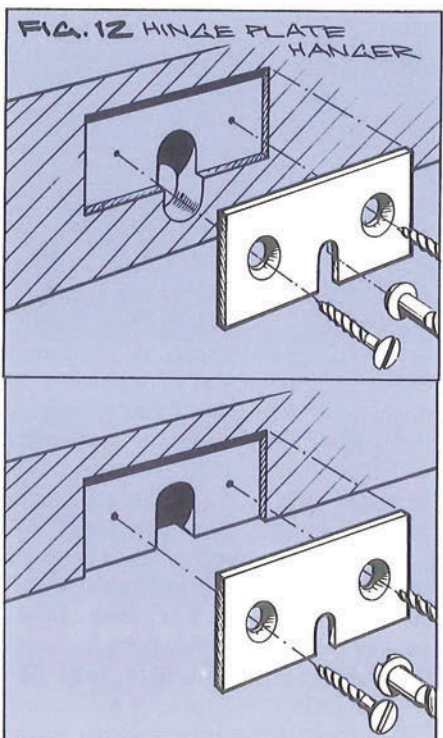
addition to the mortise for the plate itself you'll also need to drill a recess for the screw head. However, many woodworkers prefer this type of fitting to the various stamped steel hangers. On a fine piece of furniture, it's often just a matter of principle. The back of the piece may not be visible, but there's something inharmonious about using a hanger



that's stamped steel on a piece where all the other hardware is solid brass.

Shop-Made Hangers

There's something special about making hardware yourself. Fig. 12 shows a simple device that's actually just a modification of the idea behind the keyhole plate hanger shown in Fig. 11. This hanger is made by cutting off the barrel of old brass butt hinges. Each hinge yields a pair of hangers. Use a hacksaw to cut the barrel away, and then drill and hacksaw the slot. Use a file to smooth any rough edges. These shop-made hangers can also be made from steel hinges, though brass is preferred.

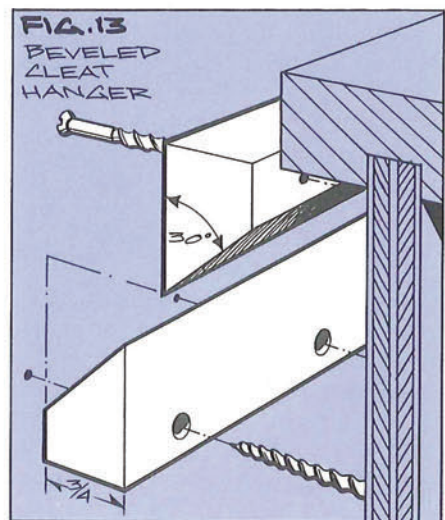


As shown, this type of fitting is used in several ways. The open-sided mortise is particularly useful for hanging shelves. But whatever the application, whether mortised into the back of a clock, into the back edges of a cabinet's sides, or into the bottom edge of a shelf, it becomes a strong, inexpensive and nearly invisible hanger.

A second shop-made hanger is the two-piece interlocking beveled cleat system shown in Fig. 13. A 30-degree angle is ripped on the two interlocking edges. One of the pieces is screwed directly to the wall and the other piece is fastened to the cabinet back. Applications are limited to cabinets where the back is recessed far enough to allow for the hanger thickness, which should be at least $\frac{3}{4}$ in.

How It's Done

Hanging cabinets can be a comedy of errors if you're trying to balance the cabinet in one hand, with a level tucked



under your arm, the drill-driver clenched in your teeth, while searching around for a stud with a hammer in your free hand.

To hang a cabinet on a drywall-over-stud wall, first locate your studs. The finishing nail and hammer technique is a never-fail approach, but investing in a stud finder will save time and eliminate a lot of unnecessary holes in the drywall. The electronic type of stud finder that reacts to density, rather than the older magnetic needle models, is recom-

mended. With it you'll be able to determine the exact center of the stud without guessing.

If you've only located one stud that falls within the area of the cabinet, don't despair. For a small cabinet, using several screws or hangers, one high and the other low, anchors the piece just as securely as if it spanned two studs.

Next, determine the height and location at which the cabinet will be hung. Then, gauging off the level, pencil a light line to mark where the bottom edge of the cabinet will fall. Again using the level, mark a second line where one side of the cabinet will fall.

If the cabinet has any weight or size to it, you'll find that a T-support is a big help. With a T-support to hold the cabinet in position, you are free to concentrate your efforts on hanging rather than supporting the piece. Professional installers use an adjustable T that quickly adjusts for any height. If available, a couple of friends or helpers can take the place of the T.

Also, don't try to sink those screws without first applying a little soap to the threads. A bar of Ivory soap with one side moistened is fine. Just run the threads lightly across the moistened side of the bar. The soap provides just enough lubrication so the screws don't bind, even in the toughest wood.

Problems

In the ideal situation you're hanging a cabinet on a wall that's flat and plumb, where there are studs to screw into. But in the real world that's rarely the case. More likely you'll be forced to anchor your cabinet with toggle bolts or hollow-wall anchors. And you'll probably be leveling and plumbing the cabinet on a wall that's neither flat nor plumb.

The answer to the question of what hollow wall anchor to use is basically just a matter of selecting the style anchor you like. With hollow wall anchors, whether it's toggle bolts, Toggler anchors, or compression spread anchors, they'll all work. But you'll need to use enough of the anchors to carry the load of what's being hung. One or two anchors are acceptable only for a light-weight piece. For a small cabinet use at least four anchors, one near each corner. For heavy objects space the anchors out

every 8 to 12 in.

Occasionally you'll encounter a situation where a more creative approach is needed. An example is hanging book shelves on a paneling-over-stud wall where the studs aren't conveniently placed. You can't use hollow wall anchors because the roughly $\frac{5}{32}$ in. thick plywood paneling isn't sturdy enough to support them. And you can't screw directly into the studs because they aren't in the right place. The only option is to temporarily remove the paneling, install two-by-four nailers between the studs, and reinstall the paneling before mounting the shelves. If you're using a shelf bracket system, instead of running horizontal nailers, it's easier to just add several new studs in the locations required to provide the brackets with the needed support. Removing the paneling is not difficult unless it's glued to the studs. Use a nail set to punch the panel nails through the paneling, and then re-nail into a new area. Touch up the old nail holes with colored wax sticks.

Additional studs or nailers can also be added to sheetrock walls, but you'll need to be handy with drywall tape and joint compound to make the necessary repairs to the wall once the new studding is added. One other possibility is to run a long bolt clear through the wall and into a cleat on the other side. But this solution is only workable where the cleat on the other side of the wall won't be an eyesore, such as inside a closet.

One common problem encountered in hanging a wall cabinet is an out-of-plumb wall. It's possible to ignore the problem, but if you do then the cabinet won't hang plumb. This can cause doors to swing open or slam shut, or may torque the cabinet out of square so the doors don't even shut. If you're hanging a clock with an expensive movement, making certain that it's plumb and level is critical. If it's not the movement probably won't work as intended.

There are two approaches to getting a cabinet or clock to hang plumb and level on a wall that's not flat. Both require adjustments to the object being hung, as opposed to adjustments to the wall. The first method is used where the cabinet has a back that's inset relative to the

sides, top and bottom. This inset enables us to make adjustments by planing down the back edges of the top, bottom or sides to conform to the wall. In order to determine the adjustment needed, first block the cabinet up so that it's in position against the wall. Make certain the cabinet is level and plumb, and then use a pencil and a small block of wood to mark a line all around the cabinet perimeter. The thickness of the block of wood should be equal to the widest point of the gap between the plumbed cabinet and the out-of-plumb wall. A hand plane or a jigsaw is then used to cut back to the scribed line. The cabinet will now be perfectly fitted to the wall. Use this technique for a permanent installation only. If you plan on moving the cabinet later, then a better approach is the filler-wedge method described below.

The second approach is required where the cabinet back is flush with the sides. Since the back is flush, there's no allowance for adjustment. This means that to get the cabinet plumb and level you'll need to shim it. If you are a stickler for detail you can rip narrow strips of the same stock as the cabinet, edge-glue them in place and apply the same finish as you used for the cabinet itself. In effect, you are just adding on to the top, bottom and sides, and then marking and cutting back as in the first method. An acceptable alternative is to rip a matching wedge as a filler and fit it in place with a dab or two of glue. Cut the filler from the same species of wood as the cabinet and finish it to match. Only you'll know about the filler wedge.

Occasionally, with a cabinet that you've built from plans, the design doesn't allow for easily hanging the project. A straightforward solution to this problem is usually just adding a cleat to the cabinet to serve as an anchor for your mounting screws. On a cabinet with a thin plywood back that's rabbeted in, the cleat is glued and screwed inside where the top and back meet. Screws are inserted along the cleat as needed to catch the wall studs. This eliminates the need for hollow wall anchors. Cleats can also be added to the outside face of the back in cabinets where the back is inset. Make the thickness of the cleat equal to the depth of the inset.



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