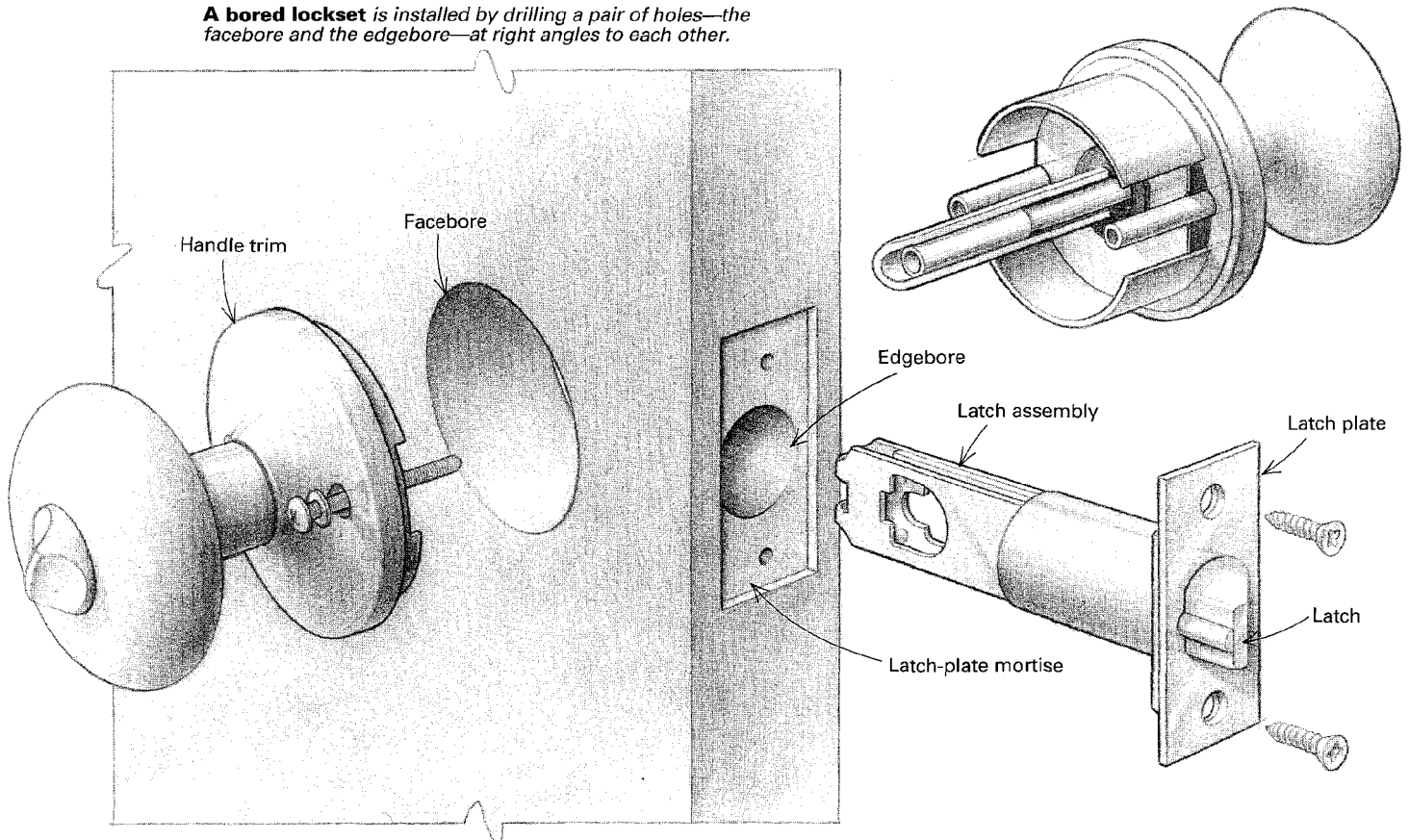


# Installing Locksets

You can do the job freehand with a chisel and a drill, but jigs and routers are faster

**A bored lockset** is installed by drilling a pair of holes—the facebore and the edgebore—at right angles to each other.



by Gary M. Katz

I don't know about you, but in my Top 10 Causes of Dizziness and Nausea on the Job, "Sheathing a Roof in a Stiff Wind" and even "Working Beneath a Hung-over Stonemason" don't rank as high as "Drilling the Edgebore Freehand in an Expensive Door." There's just not much room for error. As little as  $\frac{3}{16}$  in. stands between you and a large monetary loss.

I've been installing door hardware for years, and in this article I'll explain the process, from drilling the door to tightening the last mounting screw. Along the way I'll show you how to install a lockset if all you've got is a drill, a hole saw, a spade bit and a chisel. But I'll also talk about the specialized tools I use that help me work faster and that spell relief from dizziness and nausea.

There are two basic kinds of locksets: bored locksets and mortise locksets. Bored locksets (drawing above), the more common of the two, get their name from the fact that you install them by boring holes in the door. They come in a variety of price ranges and are relatively easy to install. Mortise locksets are big metal cases that contain both the door latch and the dead bolt. They are expensive and tough to install because they have to be mortised into the edge of the door. I'll explain that process in the April/May issue of *Fine Homebuilding*. But here I'll concentrate on bored locksets.

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**Locating the bores**—Whether you're installing a lockset, which is spring-loaded, or a dead bolt, which operates only with a key or a thumbturn, the same procedure applies. First you locate and drill two holes—one big hole through the face of the door for the handle, called the facebore, and one smaller hole in the edge of the door for the latch assembly, called the edgebore.

Most lockset manufacturers supply a paper template to align the two holes you'll have to drill. The template also helps you find the backset—the distance from the leading edge of the door to the center of the facebore. To be safe, I measure the lockset, regardless of the template. Residential locks usually have a 2 $\frac{3}{8}$ -in. backset, and commercial locks normally have a 2 $\frac{3}{4}$ -in. backset. A lock with a deep backset cannot be installed on a single-panel door or a



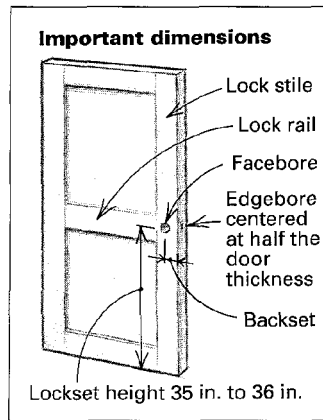
1. Mark the facebore with an awl.

French door with a 4-in. lock stile because the handle trim will overhang the back of the lockstile. Even worse, on a French doorway you risk drilling into the glass.

Another important dimension is the lock's distance from the floor. For a bored lockset, draw a line square across the edge of the door

somewhere between 35 in. and 36 in. If you've got a raised-panel door with a rail near lockset height, called a lock rail, center the lockset with the lock rail.

Fold the template to fit on the edge of the door(1). Some templates have a perforated area that you pop out so that you can see the line you drew on the door's edge. Place the template on this line and mark the center of the facebore on both sides of the door. Then find the center of the edgebore by dividing the line on the door's edge in half (drawing left).



**Freehand drilling**—You'll need a 2 $\frac{1}{2}$ -in. hole saw to drill the facebore. Hole saws vary in quality and in price, but don't sacrifice quality for a few bucks. A continuous-cylinder hole saw with a mandrel bit is superior to the hole saw with an adjustable arm extending from a centerpoint. And don't be tempted by those inexpensive multi-size sets with the concentric blades that nestle inside each other; they're awkward, time-consuming and don't even drill a round hole.

When you make the facebore (2), drill until the point of the hole saw's mandrel bit emerges from the other side of the door (3) and then

finish from the other side (4). Drilling from both sides means less worries about your drill splintering the door.

Now switch to a 1-in. spade bit for the edgebore (5). I drill the edgebore second because, with the facebore drilled, sawdust won't build up and trap the bit in the door. Put your foot against the door to keep it still, hold the drill level, sight the drill bit so that you are drilling straight into the door and let 'er rip. Don't worry, you're drilling only about 1 $\frac{1}{4}$  in. into the door, and you probably won't allow the bit to wander out the face (gulp!).



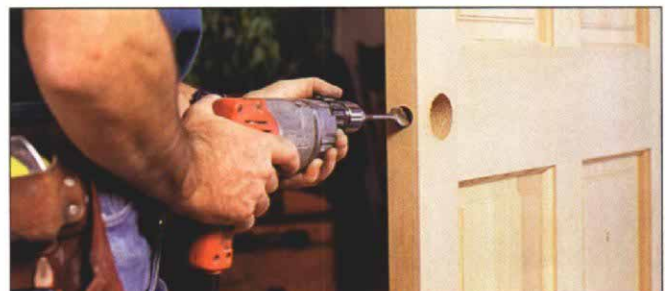
2. Start facebore, aligning hole saw with center of lock rail.



3. Stop drilling when tip emerges from opposite side.



4. Finish facebore from other side; use hole to guide mandrel bit.



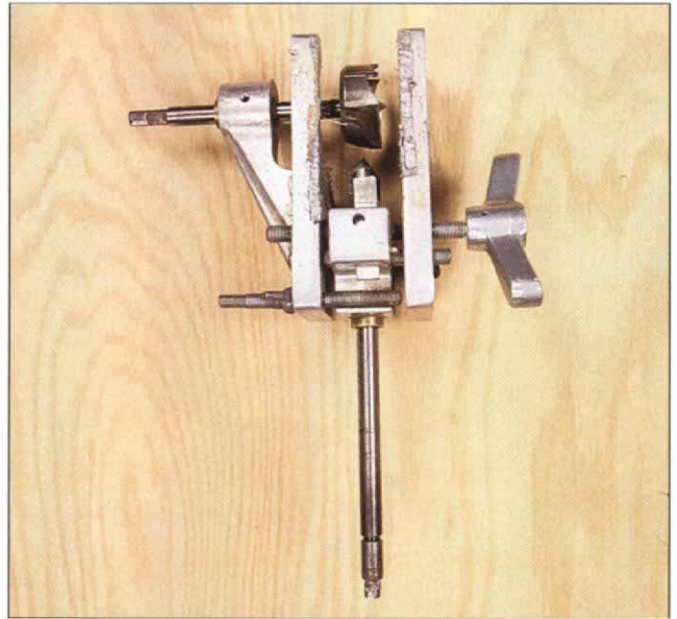
5. Hold drill level and square to drill edgebore with spade bit.

**A boring jig**—Hole saws are slow, and spade bits tend to wander, causing dizziness and nausea, especially when you're drilling an expensive door. The remedy? A lock-boring jig (6). This tool comes in a kit that has everything you need to install a lock—drill bits, markers, templates and the jig itself. The jig works a lot like a drill press that you clamp to a door. It assures accurate backsets, exact facebore and edgebore alignment and straight, worry-free edgeboring. The boring jig I use is from Classic Engineering (4344 Artesia Ave., Fullerton, Calif. 92633; 714-521-4087), but Templaco Tool Company (295 Trade St., San Marcos, Calif. 92069; 619-471-2550) also makes a good one. Although the Classic Engineering kit is less expensive than Templaco's, you can get either model for around \$300.

Instead of a hole saw, the boring jig comes with a 2½-in. spur bit for drilling facebores. A spur bit has a short, triangular tip at its center and small carbide cutters around its circumference, like a sophisticated hole saw. Spur bits cut quickly and accurately, and they leave a clean hole. An arm on the front of the boring jig holds a bushing through which you slip the bit's shaft. Opposite of this arm is a clamp pad with a 2½-in. hole in it. When it clamps on a door, the pressure of the jig's clamp pad prevents the bit from chipping around the back of the 2½-in. facebore. A reducer ring threads into the 2½-in. hole and prevents chipping when boring 1½-in. facebores for Schlage dead bolts. The jig also has spring-loaded backset stops that are easily adjusted for a 2¾-in. backset or a 2⅝-in. backset.

**Using the jig**—A 1-in. edgeboring bit is always in my boring jig. I position the jig on the door by touching the point of the 1-in. edgeboring bit to the pencil mark I drew for the edgebore. The jig itself has a small wing nut that adjusts for the thickness of the door and centers the edgebore. I slide the jig forward so that the backset stops are resting firmly against the edge of the door. Then I clamp the jig snug on the door by tightening a big wing nut at the front of the jig.

The strange thing about a boring jig is that you have to chuck up the bits after the jig is clamped on the door. My kit came with a quick-release driver to make it easier to set up the bits in the drill. But the quick release could not be disengaged while the drill was spinning,



6. The boring jig works like a drill press that you clamp to a door.

and I like to move quickly. To solve this problem, I fit my ½-in. drill with a standard ⅜-in. socket extension to drive the bits. I can pull my ⅜-in. extension off the bit while the drill motor is still spinning, which I couldn't do safely with the quick-release driver supplied with my boring kit. I didn't have to make any modifications to the drill or the bits; the extension fit into the ½-in. chuck, and the bits in the boring kit have boltlike hexagonal ends.

I drill the facebore first (7), and then I pull the bit straight through the door (8). Removing the spur bit from the jig saves the tip of my edgeboring bit from colliding with the spur bit while I'm drilling the edgebore (9).



7. Drive the faceboring bit with a drill fitted with a socket adapter.



8. Remove the spur bit from the jig before drilling the edgebore.



9. A boring jig ensures straight, worry-free edgeboring.

**Chiseled mortises**—For the latch assembly to sit flush in the edge of the door, you'll need to mortise for the latch plate. Then you locate and drill a hole in the jamb to catch the latch, and mortise the jamb for the strike plate. Put the hardware together, and you're done.

With the facebore and the edgebore drilled, slide the latch assembly into the edgebore, square it up and trace around the latch plate with a sharp pencil (10). Use a scratch awl and a knife to score the outline of the latch-plate mortise. On the top and the bottom, use the knife to make a clean cut. On the sides use the scratch awl (11); it won't get caught up in the grain and stray off the mark.

With a  $\frac{3}{8}$ -in. chisel, score the wood in about  $\frac{1}{4}$ -in. increments down the length of the mortise. The scores, which are made with a single hammer blow to the chisel held at  $45^\circ$ , go square across the grain. Scoring helps prevent wood tearout as you cut the mortise. Tap the chisel down from the center to the bottom of the mortise (12 and 13), then finish it by tapping up from the center to the top of the mortise. A

latch-plate mortise should be about  $\frac{3}{16}$  in. deep. Remember, always keep the chisel's bevel against the wood. Insert the latch assembly and check the fit; shave a little more if necessary.

Once the latch plate is flush with the edge of the door, close the door so that the latch is touching the edge of the jamb. Find the center of the latch (you can eyeball this one) and mark it on the side of the jamb. Open the door and square this mark across the face of the jamb. Center the hole in the strike plate on the line and position the strike plate so that it's centered between the door stop and the edge of the jamb. Trace around the outside of the strike plate as you did the latch plate, but then also trace around the inside of the latch opening (14). Before chiseling, drill a 1-in. dia. hole  $\frac{5}{8}$ -in. deep into the jamb, right in the middle of the tracing you made of the latch opening (15). Then use the same chiseling technique to mortise for the strike plate. Drill pilot holes (16) for all the mounting screws so that you won't split the jamb or the door.



10. Insert the latch and trace the latch-plate outline.



11. Use an awl to score the two edges with the grain.



12, 13. Chisel out the scored mortise from center to bottom and then finish it by chiseling up from the center.



14. Trace the strike plate and the latch opening.



15. Drill the latch hole in the middle of the penciled outline.



16. To prevent screws from splitting the wood, drill pilot holes.



17. A template tacked to the door has an opening that guides a straight router bit set to cut a shallow latch-plate mortise.



18. Set the corner chisel in the mortise and strike the retractable plunger blade to square off the rounded corners left by the router.

**Routed mortises**—Just as my days of drilling doors freehand are behind me, so too are my days of chiseling mortises for latch plates and strike plates. Instead, I use a router and some homemade templates (see sidebar facing page). My templates require the same router setup as most professional hinge-mortising templates—a ½-in. straight-cutter bit (Porter-Cable #43614) and a ⅝-in. O. D. router collet (a removable template guide in which the bit spins). Because the collet is ⅛ in. wider than the cut diameter of the bit, the template openings are ⅛ in. larger than the door hardware.

I attach the appropriate latch-mortising template to the door (17) and center it by eye. However, locators are available that fit into the template opening and into the bores to position the templates. I place my router against the template so that the router bit is inside the template opening, then I turn on the motor. This practice helps save the template from nicks. I keep the router collet in contact with the edges of the template opening, then I hog out the center. When I am finished, I try to remove the router without nicking the sides of the template. I don't always succeed. I use a corner chisel (Porter-Cable #42234) to square up the rounded corners left by the router (18) and plastic auto-body filler to fill nicks in my router templates.

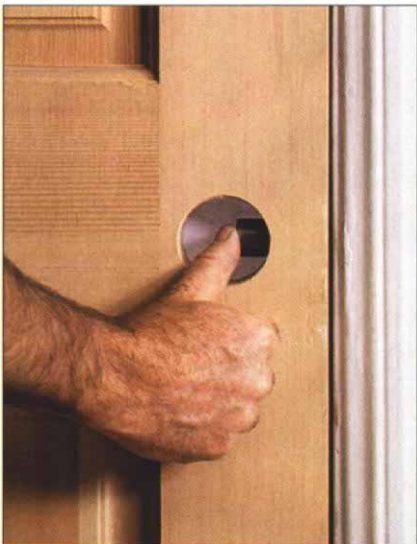
My boring kit came with a device called a center marker (a steel cylinder with a sharp point centered on its face) that's used to find the exact position for the strike hole on the jamb. I slide the center marker into the edgebore (19), point out, and close the door against the doorstop. I stick my finger into the facebore and push the point of the locator into the jamb (20). This leaves a small dimple, which I carefully circle with a pencil. The center marker assures that the strike hole and the latch will align properly; the pencil mark guarantees that I won't drill a 1-in. strike hole in a gravel dimple or a nail hole. Imagine shutting a finished door and seeing the strike 3 in. above the lockset. Right. Dizziness and nausea.

I chuck up a 1-in. Forstner bit to drill the strike hole. A Forstner bit, with its razor-edge cutting rim and its interior pair of chisel-like lifters, leaves a clean, flat hole. For a lockset I try not to drill completely through the jamb unless I'm installing a dust bucket—the molded plastic or brass insert that provides a finished background within the strike hole. Actually, dust buckets do more than just look good; they prevent loose material behind the jamb from slipping into the strike hole and fouling the lock operation. With the strike hole drilled, I attach a strike-plate template to the jamb and follow the same procedures I used when mortising the door.

The rest is a simple matter of screwing together the hardware. I drill pilot holes and install the latch plate (21) and the strike plate first, then I link up the handle trim. Remember not to set the screws too tight, which could interfere with the operation of the hardware. I check every operation of a lockset at least twice—once against dizziness, once against nausea. □



19. Insert the center marker, point out.



20. Push the marker to dent the jamb.



21. Install the latch before the knobs.

## Making router templates

You can buy manufactured templates for routing latch- and strike-plate mortises, but the templates I've seen are plastic, and if you nick one, you might as well throw it into the recycling bin. I made my templates from hardwood (photos below). If I nick one, I fill the nick with auto-body filler, and it's as good as new.

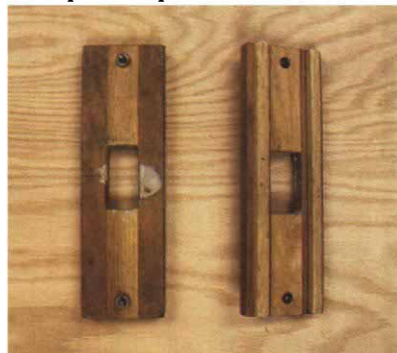
Instead of cutting a hole in a larger piece, I get a crisp template opening by gluing up strips of hardwood (drawing below). Because the collet on my router is  $\frac{1}{8}$  in. wider than my  $\frac{1}{2}$ -in. straight-cutter bit, the template openings are  $\frac{1}{8}$  in. larger than the latch and strike plates. For example, I made the template for a 1-in. by 2 $\frac{1}{4}$ -in. latch plate by gluing two 1 $\frac{1}{8}$ -in. wide hardwood strips between another pair of hardwood strips about 12 in. long. I spread the 1 $\frac{1}{8}$ -in. strips 2 $\frac{3}{8}$  in. apart—the length of the latch plate plus the thickness of the collet.

After trimming the ends of the template, I drilled a hole at the top and the bottom and installed template pins (Bosch #83018). A template pin is a retractable brad set in a sleeve that's threaded on the back. It allows you to tack the template in place and then remove it easily. You can buy template pins individually or by the dozen at just about any serious tool outlet.

### Strike-plate templates.



### Latch-plate templates.



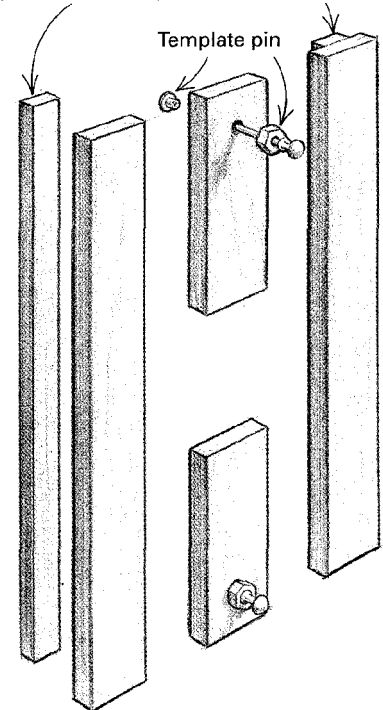
Because I work mostly on 1 $\frac{3}{4}$ -in. thick doors, I screwed two narrow hardwood strips 1 $\frac{3}{4}$  in. apart on the back of each latch-plate template, one strip on each side of the opening. This modification allows me to position the template quickly with only one pin.

On my strike-plate templates, I use a  $\frac{1}{8}$ -in. steel strip on the doorstop side to complete the opening. I notched some of these templates with a jigsaw to create the shape of the flange on a T-shaped strike. I grooved these same templates lengthwise and put another steel strip in the groove. This removable strip covers the notch and lets me use the same template to mortise for a T-strike or a rectangular strike.

Latch plates are generally a little thicker than strike plates. Therefore, I made my strike templates  $\frac{1}{16}$ -in. thicker than my latch templates so that I don't have to change the depth of my router. Actually, all my templates are based on the depth of hinge mortises. I often mortise for latch plates, strike plates and hinges at the same time, so I've linked the thickness of my strike and latch templates to the thickness of my hinge templates. With this system I rarely alter the depth of the  $\frac{1}{2}$ -in. router bit. —G. K.

**Latch-plate template.** Hardwood strips are glued so that the opening matches the size of the latch plate plus  $\frac{1}{8}$  in. for the router collet.

Narrow strips fastened to the back help position the template on 1 $\frac{3}{4}$ -in. thick doors.



***Erratum***

In Gary Katz's article "Installing Locksets" (*FHB* #79), on p. 44 we incorrectly referred to a template guide as a router collet. A collet is the part of a router that holds the bit. A template guide is a bushing that attaches to the router base and rides against the edge of a template.