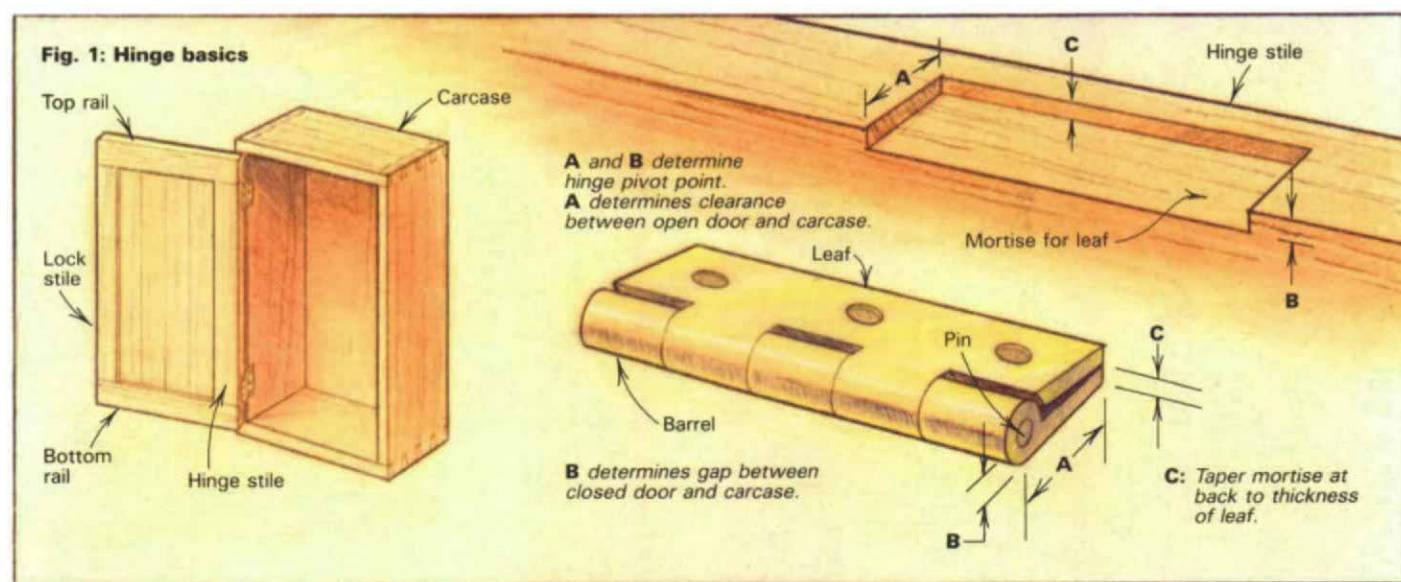


Hanging a Cabinet Door

Swinging with brass butt hinges

by Roger Holmes



Hanging a cabinet door well is as important as making it well—unsightly gaps, a sloppy fit or a sticky door can ruin the effect of the loveliest wood and most meticulous joinery. You can hang a door with anything from interlocking clenched nails to space-age plastic inserts. Solid, extruded (or drawn) brass butt hinges have a nice look and feel, and I prefer them for most quality work. Accurate layout and a careful, step-by-step approach are essential to making butt hinges work properly, as well as look nice. Although I will describe how to hang a flush door (one hung inside the carcase, flush with the carcase edges), the steps are much the same for butt-hinging other types of doors, too.

You may have a little trouble finding extruded hinges. Most hardware store brass hinges are stamped or pressed from a single sheet, and the hinge barrels are bent around the pins. Although these hinges are cheaper than the extruded ones, their leaves are thin and often rattle around the pin. Extruded hinges, made by forcing hot brass through dies shaped to the desired cross-section, are generally heavier, tighter and sturdier than pressed hinges. (Extruded brass hinges in a variety of sizes are available from Garrett Wade, 161 Avenue of the Americas, New York, N.Y. 10013.)

Hinges are commonly described by their height and open width, in that order. A 2-in. by 1½ in. hinge, therefore, has leaves ¾-in. wide, measured to the center of the barrel. The width of the hinge needed for each door depends on the thickness of the

door stile and width of the hinging surface on the carcase. You can figure widths on a full-scale drawing or by trying various hinges against the door itself. If you want a rough general rule, double the thickness of the stile (or carcase surface if it's narrower) to get the hinge width. A ¾-in. door, for example, can accommodate a 1½-in.-wide hinge. The barrel protrudes beyond door and carcase, allowing the door to swing open and making room for a stopped mortise, which hides the edge of the hinge from view on the door's inside face. Long hinges give more support, for obvious reasons, but balance length against looks—I seldom use hinges longer than 2 in. on all but the largest cabinets.

The leaves of extruded hinges can be rectangular in section or tapered. A tapered hinge is lighter for the same strength, but the difference is insignificant for cabinet-sized hinges; there are only minor differences in installation. Most cabinet butts I've found have been tapered. I recommend fixed-pin hinges for cabinet doors; the convenience of loose-pin hinges, which can be disassembled during installation, is outweighed by the sloppy fit of pin to leaves.

I use two butt hinges for most cabinet doors, adding a third in the middle of doors over 30 in. high. The position of the top and bottom hinges is mostly a matter of taste. I usually try to line them up in some way with the top and bottom rails of frame-and-panel doors. The middle hinge isn't necessary for strength as much as to keep the center of the hinge stile from moving slight-

Fig. 2: Hinge geometry

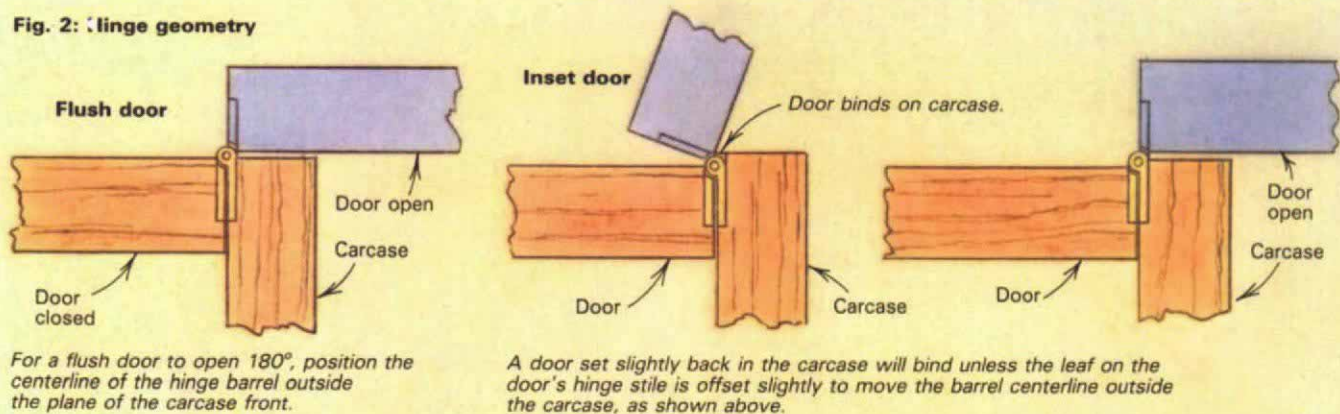
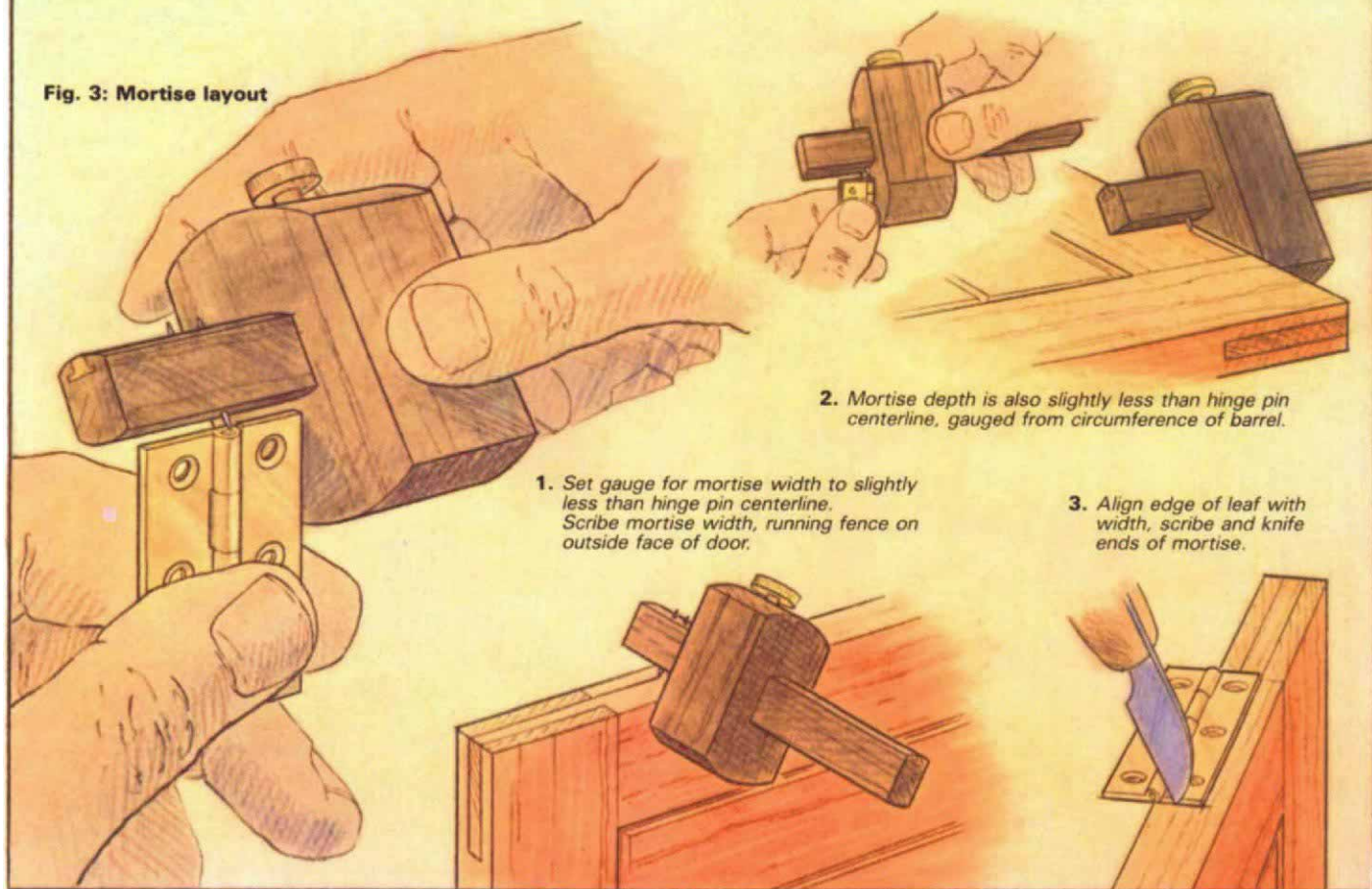


Fig. 3: Mortise layout



ly and binding the door. A center hinge can help to pull a slight bow out of a door, too. The position of the centerline of the pin, which is the pivot point of the hinge, determines how far the door will open, as shown in figure 2. A full-scale section drawing through door, hinge and carcass will help determine hinge position—rotate the hinge on a push-pin pivot to see how far the door will open.

I think a well-fitted door should show a uniform gap between it and the surrounding carcass. It should open smoothly, without binding or sticking. For doors that won't expand or contract much with changes in ambient humidity, such as frame-and-panel or veneered doors, I shoot for gaps of $\frac{1}{32}$ in. all around; more if I'm hanging the door during the dry season. The larger the door, the greater the gap should be. You can vary the size of the gap between hinge stile and carcass by varying the depth of the mortises

for the leaves. Making the mortises half the diameter of the barrel (the centerline of the pin) will bring the stile flush to the carcass. Shallower mortises give greater clearance. The barrel diameter of most cabinet-size brass butts is greater than the combined thicknesses of the two tapered leaves. A closed hinge will, therefore, taper. To make a neat job, I taper the mortises from front to back so that the back edge of the hinge will be flush with the surface.

When you build the carcass, make it as square as possible, especially at the door opening. Sight over the carcass or frame around the opening, as you would over winding sticks, to check for twist, and plane off high spots. Make the door slightly larger (at least $\frac{1}{16}$ in. overall) than the opening. Then, regardless of the type of door—frame and panel, veneered, board and batten—make sure it's flat. It's virtually impossible to correct all but the

slightest of twists during hanging. Check for twist by rocking the door on a flat surface or by sighting over winding sticks. A slight twist can be planed out, but if you find yourself thinning the door down appreciably to remove a twist, make another door.

Next, fit the door to the opening. First plane the edge of the door's hinge stile flat and square to the door's face. Try the door to the opening, pressing the hinge stile against the carcase side and the bottom rail against the carcase bottom. Plane off the wood necessary to make the bottom rail conform to the carcase. Try the door to the opening again, then plane the top rail to fit; repeat for the final stile. The order isn't important, as long as the result is a door that slips into the opening with very little play up or down. You can plane the door to create the clearance now and hang the door using shims—small pieces of card or veneer as thick as the desired gap—inserted between door and carcase. I prefer to hang the door first, then plane for clearance.

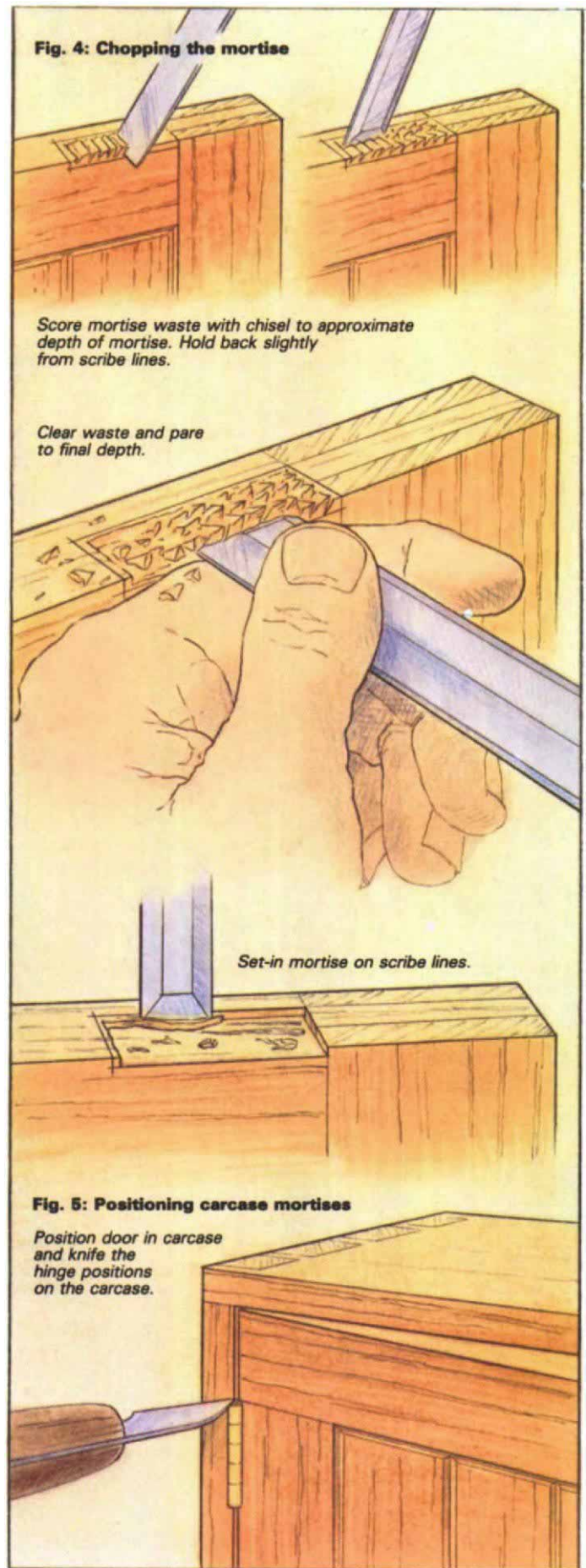
After determining the position of the hinges, I mortise the door first. (I'll describe fitting a door flush with the carcase, a fine gap all around. Alter the marking gauge settings to suit your taste.) Put the door hinge-stile-up in the vise, set a marking gauge from the edge of the leaf to just shy of the pin centerline. This locates the pivot point outside the carcase and allows the door to open 180° (figure 2). Mark the edge of the hinge stile at the hinge locations, running the fence against the outside face of the door (figure 3). Set another gauge for the mortise depth; again, just shy of the pin centerline. The amount by which the setting is shy of dead center equals half the finished gap between door and carcase. (Two gauges are useful for hanging a flush door, as the settings are the same for laying out the mortises on the carcase.) Scribe this setting on the face of the door at the hinge locations. Position the hinge on the door, its long edge aligned with the first gauge mark and knife against its ends. This ensures a snug fit in the mortise—the ends of few hinges are exactly square to the edges.

Now chisel out the waste. I carefully score the gauged and knifed lines with a sharp chisel, then make a series of chops, as shown in figure 4, along the length of the mortise, about $\frac{1}{2}$ in. from the scored outlines and as near the final depth as possible. The chops break the wood fibers and make it easy to clean to the bottom of the mortise by paring with a wide chisel. Finally, slice down to establish the outline and try the hinge in place.

I fix the hinge through only one hole at this time, in case it needs adjusting later. Centering screws in hinge holes can be terribly frustrating, particularly in open-grained woods. I position the hole with a carefully placed awl and a steady hand. Deepen the hole with the awl when the position is right, to keep the pilot-hole bit from wandering. I place the screw just off-center toward the back of the mortise, so it will pull the hinge tight. It is prudent to use steel screws during fitting. Brass screws have an infuriating tendency to twist off; steel screws prepare the way for the final installation with brass screws, thereby avoiding much gnashing of teeth.

Next, fold the hinges shut and slip the door into the carcase; the lock stile won't go in all the way because of the hinges. Knife the positions of the hinges on the carcase side (figure 5). If you've already planed for clearance, place the shims before knifing. Remove the door and gauge the mortise width and depth on the carcase. Align the hinge with the knifed position marks and knife the mortise ends, as for the door. It's most convenient to chop and pare the mortises with the carcase side supported on the workbench.

Now screw the door to the carcase, one screw to a leaf. I plane



clearance on the lock stile first, beveling the edge back from the front to allow for the radius of the swing. Then plane top and bottom rails. You'll probably have the doors on and off two or three times to do this, so remember to use the steel screws. Uniform gaps make a single door look good and a row of doors look even better, so it's worth a little extra trouble.

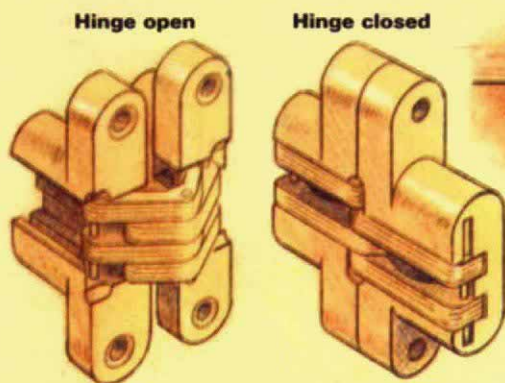
Though attractive, simple and durable, butt hinges aren't built for adjustment. Vertical movement is impossible without plugging screw holes and extending mortises. You can adjust the gaps by packing out one or more hinge mortises with paper, card

or veneer shims. You make a slight twist in a **door less** noticeable by adjusting the width of a mortise. If, for example, the bottom of the lock stile is set farther back from the carcass edge than the top is, widen the top carcass hinge mortise. This will pull the top of the hinge stile in and push the bottom of the lock stile out. This is just a balancing technique, evening the twist out around the door; it can't be relied upon to take the twist out of the door. □

Roger Holmes is an associate editor of Fine Woodworking.

Router mortising Soss hinges

by C.B. Oliver



All mortise dimensions must match hinge dimensions exactly, except for A and B, which can be slightly deeper and longer. Rout deep mortise for hinge body first, then shallow mortise for flange.

Soss invisible multi-leaf hinges, which have been used by commercial cabinet-makers for years, can be a good choice if you don't want to clutter up an understated design with exposed hardware. Soss hinges range in size from ½-in.-dia. cylinders to 5½-in. long hinges for entry doors, and even the smallest are extremely strong. (Soss provides a chart for proper hinge selection.) In addition to doors, Soss hinges can be used for table leaves and desk tops, boxes and so on. Also, the hinge bodies are radiused, so no follow-up chisel work is needed if you mortise with a router or a drill press.

Plunge routers are real slick for installing Soss hinges. For flush-door face-frame construction, I mill the hinge mortises in the hinge stiles of both door and frame before gluing up, as shown in the drawing. To allow for inaccuracies, make the door a little larger than the opening, then plane it to fit once you've hung it. You could make up a mortising jig similar to the one Tage Frid wrote about in *FWW* #30, but the fence on any good plunge router will work fine as a guide. (Soss includes a template to position the hinges in from the door and frame faces.) I clamp the door stile to the carcass side or face rail face-side-out, then mount this entire assembly in a bench vise.

Rout in two steps by making a deep, short mortise for the hinge body, and a shallower, longer one for the mounting flange. The bit radius must match the ra-

dius of the hinge flange you're using. With the router's fence held firmly against the stock, mill the deeper mortise first. Keep the bit from wandering by always moving the router against its rotation. The length of the deep mortise is not critical; in fact, if it's a little too long, final fitting is easier. Place the hinges in the deep mortises, position them where you want them, and mark the position of the mounting-flange ends with a knife. Set the router to the flange thickness and mill the longer mortise. Instead of devising stop blocks to fix the length, I "creep up" on the marks. Work slowly—it is a lot easier to lengthen the mortise than it is to shorten it.

The method shown here will also work with routers that do not have built-in plunge mechanisms. Mill the deeper mortise in two or three passes by holding the router's fence against the work and lowering the bit slowly at an angle until the base rests firmly on the edges of both clamped parts. To ease the cutting load, you can waste most of the mortise on a drill press or with a portable drill guided by a dowel jig. □

C.B. Oliver makes furniture in Nottingham, N.H. Soss hinges are available from Builders Specialty & Hardware Corp., 26 Weston Ave., P.O. Box 325, West Somerville, Mass. 02144, or you can write Soss directly at Box 8200, Detroit, Mich. 48213.

