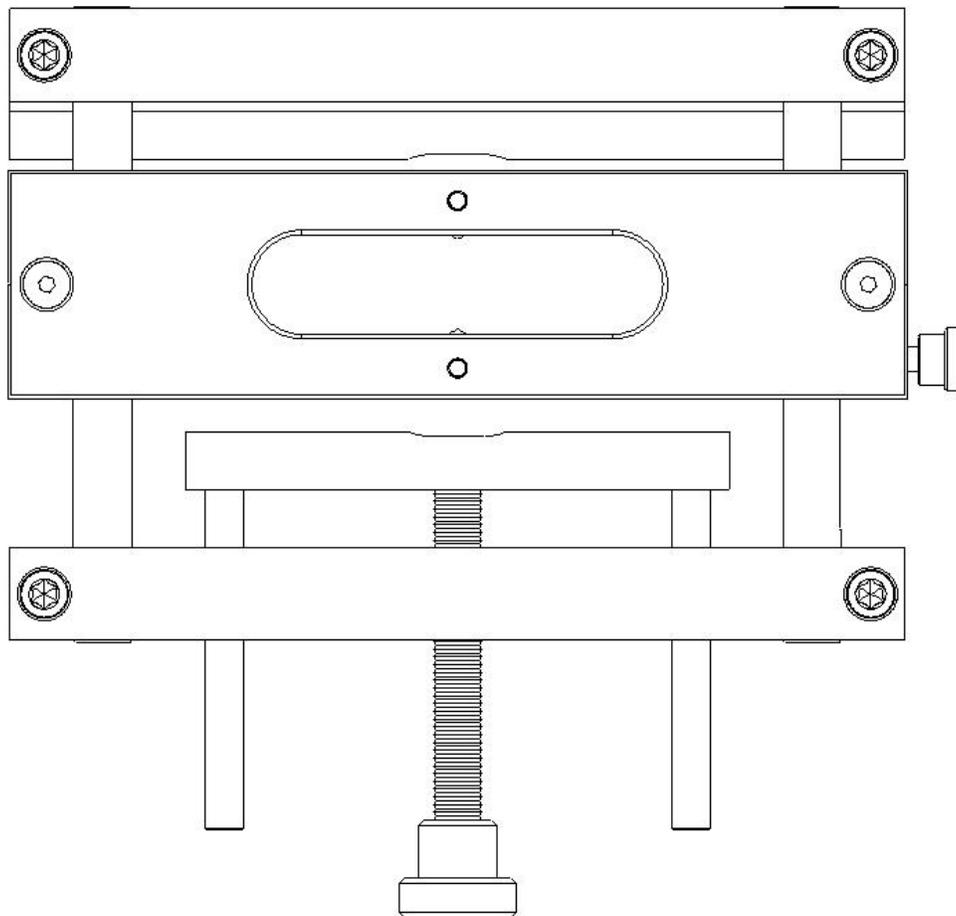


# Mortise Pal™

## Mortising Jig

### User's Manual



Revision-C

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# Mortise Pal™ Mortising Jig

## User's Manual

Thank you for your purchase. Mortise Pal™ allows you to make precision slot mortises with your plunge router. If used properly, the jig should provide years of trouble free operation. Please take the time to thoroughly read this manual and familiarize yourself with how the jig is used as well as the jig's safety precautions.

### Kit Contents:

As shown in Fig. 1, the jig is supplied with:

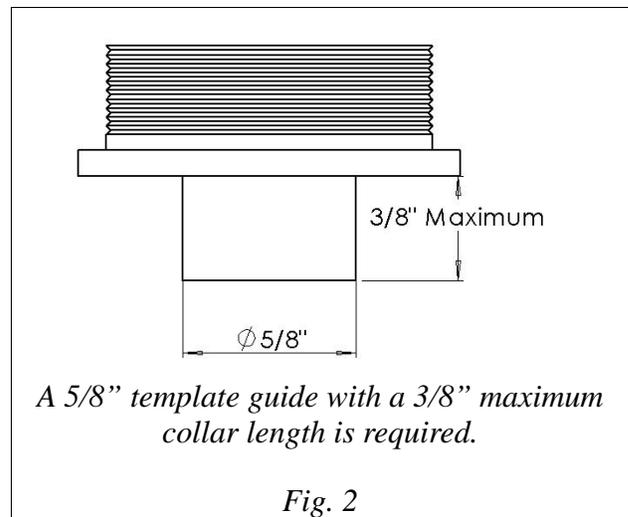
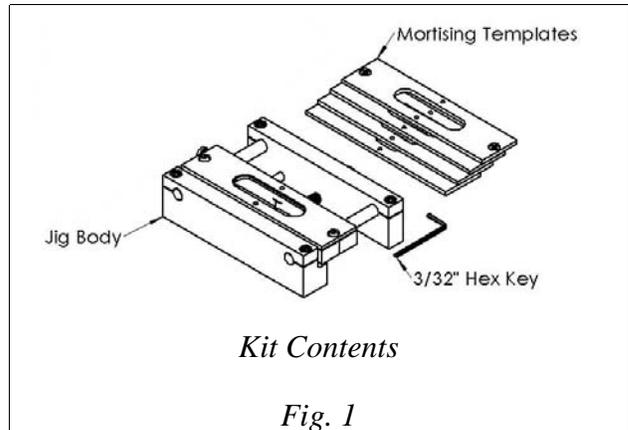
- (1) Jig Body
- (4) Mortising Templates
- (1) 3/32" Hex Key

### Required Items:

To use the jig you will be required to supply:

- A plunge router with a 6" base plate. The jig is designed to be use with smaller sized plunge routers with a 6" base plate. These routers are generally 2-1/4 horsepower or less and weigh less than 12 pounds. The jig is not designed for and should not be used with heavier plunge routers.
- A router bit. Spiral up-cut bits are recommended as they remove waste from the mortise while routing.
- A 5/8" outside diameter template guide. Please note that the collar on the template guide must be no longer than 3/8" as shown in Fig. 2. A quality template guide with a centering pin is highly recommended.

We offer a precision template guide manufactured by Whiteside Machine Company as an accessory. Note: for best results in your joinery it is important to install the template guide so that it is concentric with your router spindle. A template guide that is not concentric with the spindle can produce unwanted problems with your joinery. A quality template guide installed using a centering pin will avoid this problem. If you choose not to use a centering pin, please see the section on page 12 for a tip on minimizing this problem.



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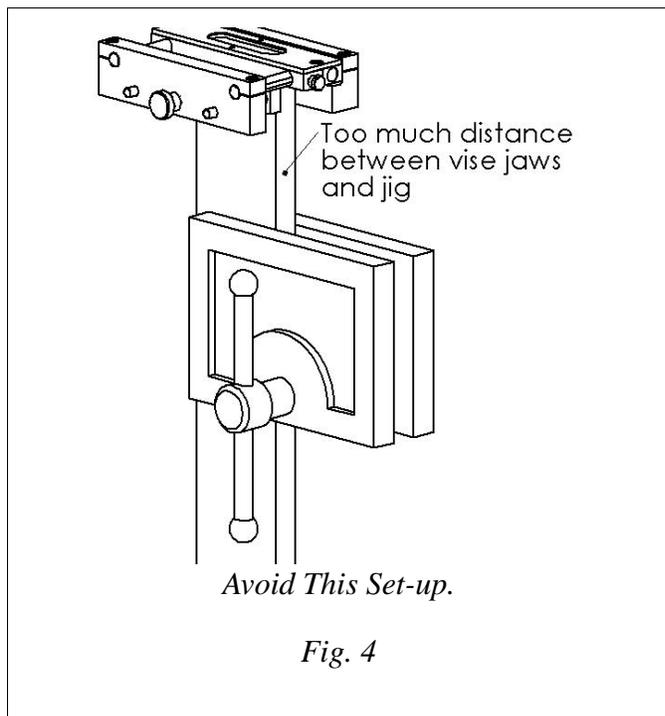
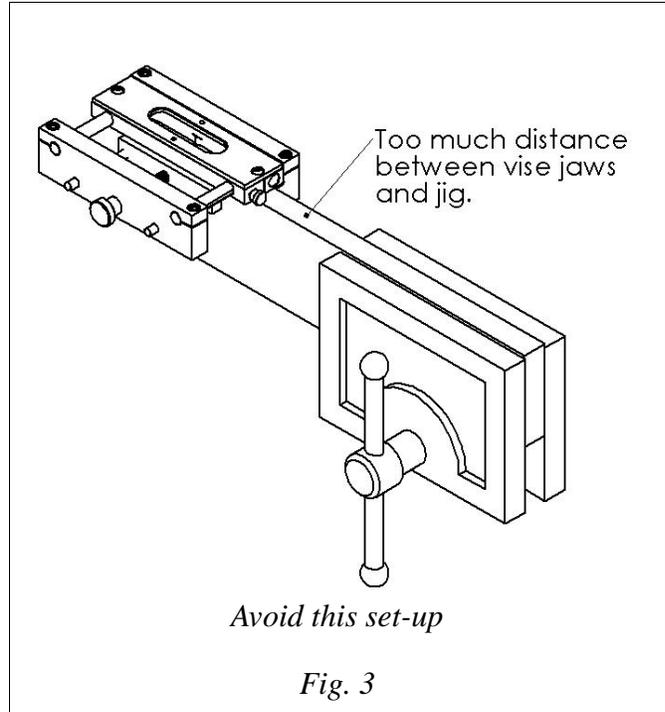
### Safety:

To operate this or any tool safely and efficiently, it is essential to become as familiar as possible with its characteristics. Take as much time as necessary to become familiar with the jig. Also, read and follow all of the safety procedures noted in this manual. If you do not understand any of the operations or safety guidelines discussed in this manual, please get answers to all your questions before attempting to use the jig by emailing [support@mortisepal.com](mailto:support@mortisepal.com) or calling 619-459-7951.

Read, understand, and follow all of the instructions and safety guidelines that were included with your plunge router.

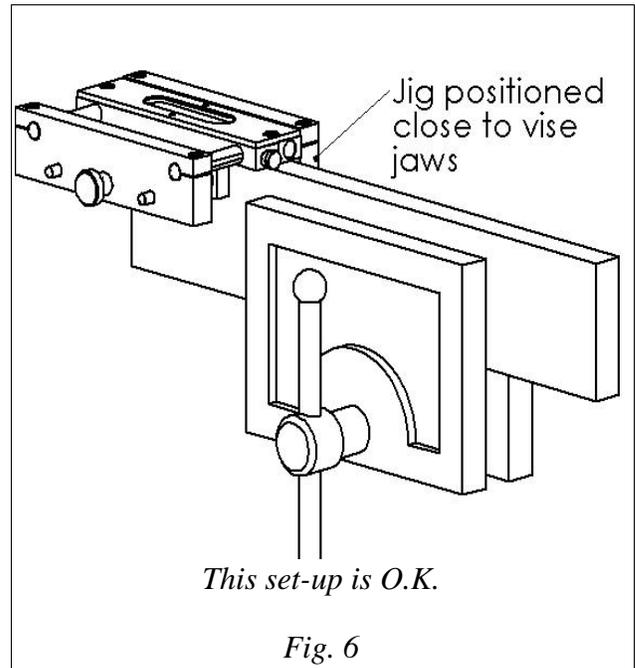
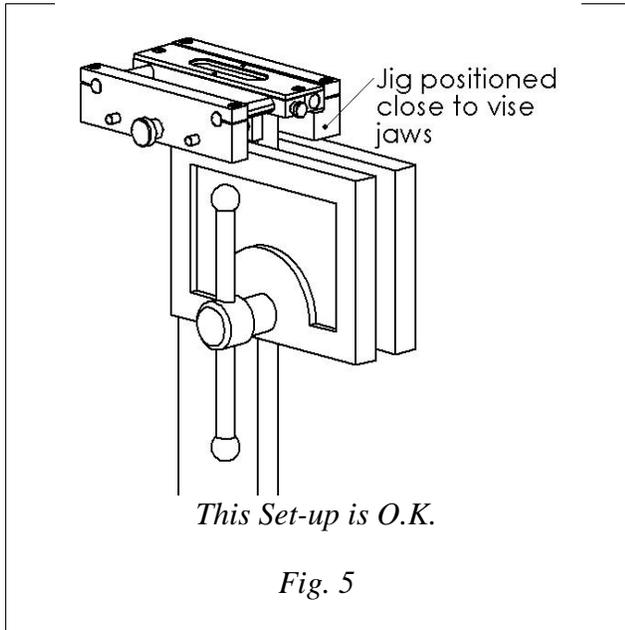
Proper workpiece holding is essential for the safe use of the jig. The workpiece must be held securely with clamps, in a woodworkers vise, or by other suitable means. A workpiece that is not properly secured could move while routing, creating an unsafe situation or damaging the jig.

When using a woodworker's vise avoid clamping the jig to your stock as shown in Figures 3 and 4. The jig is shown clamped to the stock with too much distance between the jig and the vise jaws. Forces generated from routing could leverage the stock and cause it to move. Figures 5 and 6 illustrate a safer setup when clamping stock in a woodworkers vise. The stock has been repositioned so that the jig is closer to the vise jaws. Forces generated from routing are less likely to leverage the stock.



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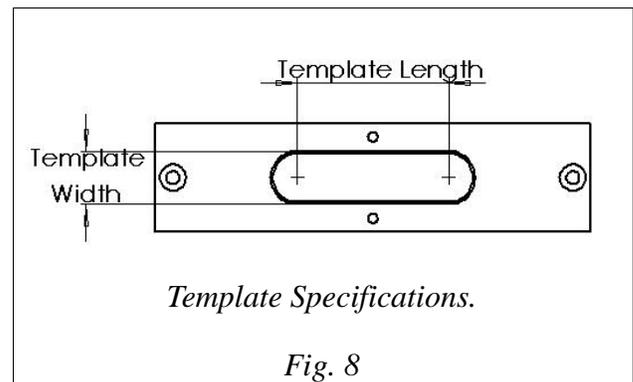
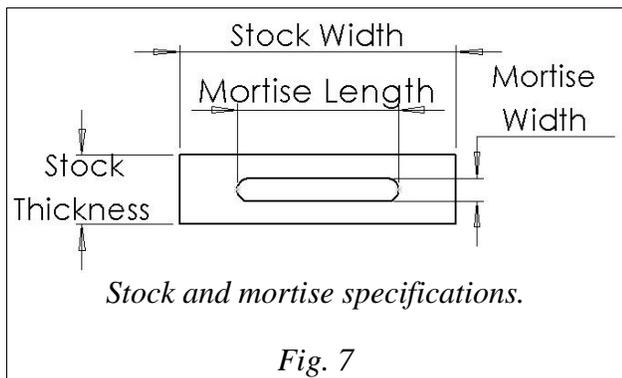


### Specifications:

Referring to Fig. 7:

- The minimum **stock width** is 1". Your stock needs to be at least 1" wide to be securely clamped in the jig.
- The minimum **stock thickness** is 3/4". Note, mortises may be made in thinner stock by using shims. See the section on page 11 for details.
- The maximum **stock thickness** is 2".
- The maximum **mortise width** is 1/2" as determined by the largest bit to fit through a 5/8" outside diameter template guide.
- The **mortise length** is determined by the template used and the diameter of the router bit used.

Referring to Fig. 8, the **template length** is measured from center to center along the slot. The templates



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supplied with the jig come in four lengths, 1/2", 1", 1 1/2" and 2". To determine the overall mortise length add the template length to the bit diameter. For example, the 1" template used with a 3/8" bit produces a 1-3/8" mortise. The same template used with a 1/4" bit produces a 1-1/4" mortise. Table 1 can be used to determine the overall mortise length for common sized router bits. Note, by overlapping mortises it is possible to create mortises of virtually any length. Please see the section on page 9 for details.

Template Length (in)	Mortise Length (in)			
1/2	3/4	13/16"	7/8	1
1	1 1/4	1 5/16"	1 3/8	1 1/2
1 1/2	1 3/4	1 13/16"	1 7/8	2
2	2 1/4	2 5/16"	2 3/8	2 1/2
Bit Diameter (in)	1/4	5/16"	3/8	1/2

*Mortise length equals template length plus bit diameter.*

*Table 1*

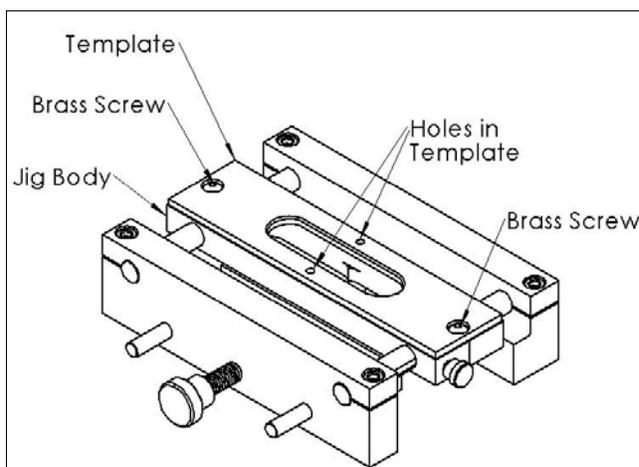
- Referring again to Fig. 8, the **template width** is 41/64", or 1/64" larger than a 5/8" template guide. This small space between the template guide and the template allows you to rout the mortise by moving your router around the template thereby producing a mortise with an excellent surface finish on the walls. Just remember that your finished mortise will be 1/64" larger than the bit diameter. The recommended technique for routing will be discussed in the section that follows.

### Using the Jig:

Using the jig generally requires the following four steps:

1. Selecting and installing a template.
2. Making layout lines on your stock.
3. Setting up the jig.
4. Routing the mortise.

**Step 1.** Referring to Fig. 9, select a **template** and then install it by first removing the **brass screws**. Use the 3/32" hex key that was included with the jig. Place the template onto the **jig body** so that the **holes** in the template mate with the corresponding dowel pins on the jig body. Press down firmly to ensure that the holes in the template mate with the dowel pins. The templates are designed to mate with the dowel pins with a friction fit. Carefully replace the brass screws. To remove the template, remove the brass screws, insert your index finger into the slot on the template and pull it off of the jig body.



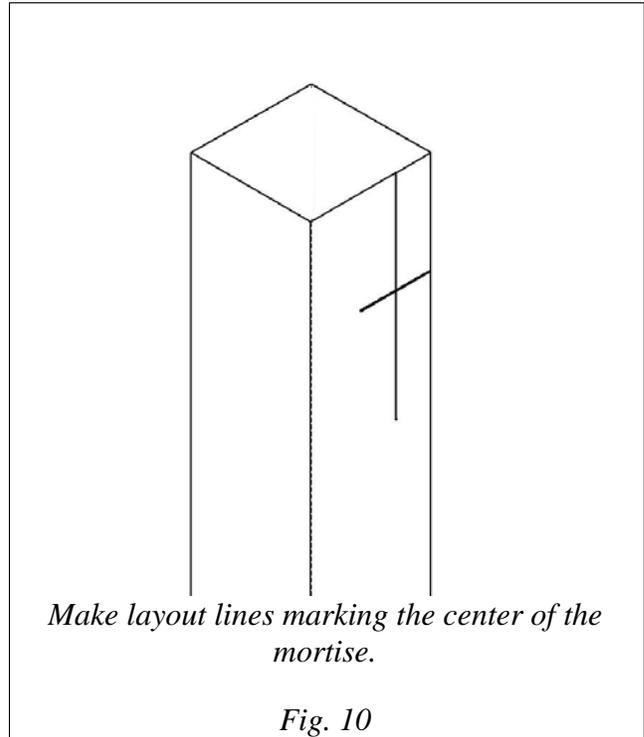
*Install template by removing brass screws and placing template over dowel pins.*

*Fig. 9*

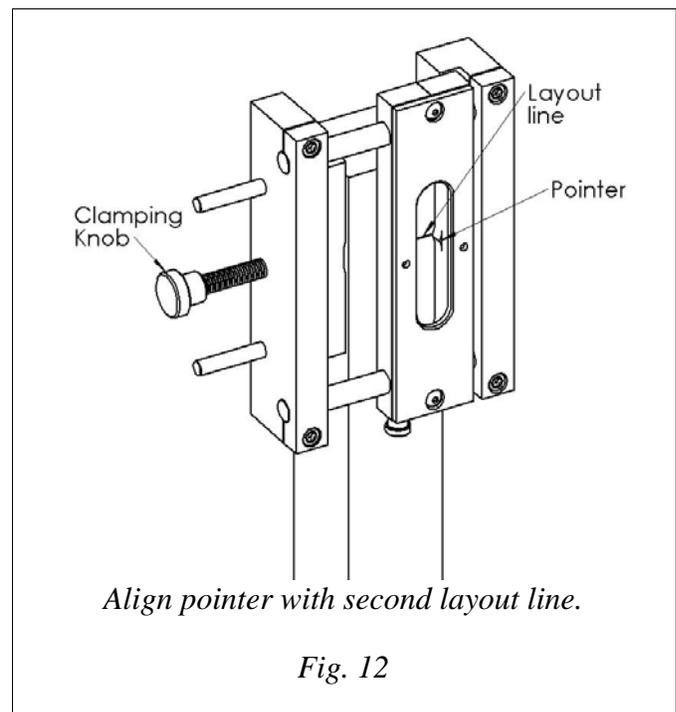
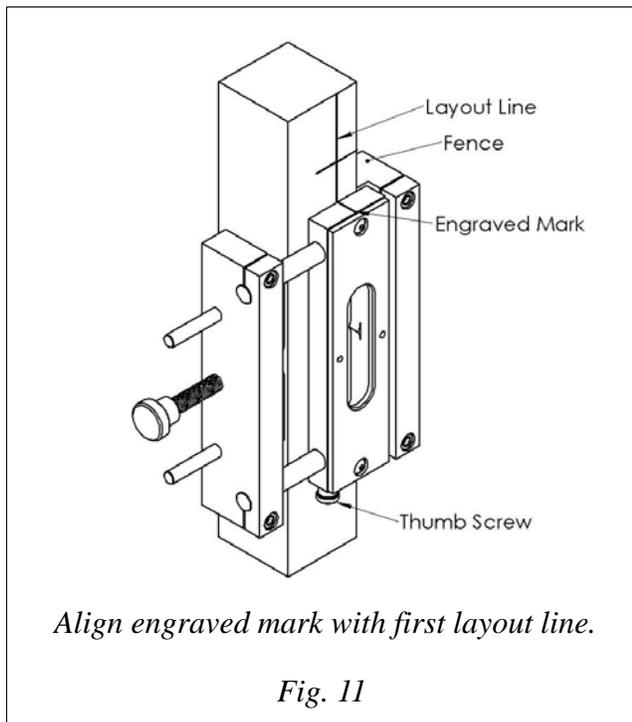
# Mortise Pal™ Mortising Jig User's Manual

**Step 2.** Make layout lines on your stock that mark the center of the mortise. Fig 10 shows the completed layout lines on a leg blank before the mortise has been routed.

**Step 3.** Setting up the jig will require centering the template over the layout lines. Referring to Fig. 11, hold the jig's **fence** against the stock. Note, it is easiest to perform this step with the jig *not* clamped to the stock. Align the **engraved mark** on the side of the jig with the first **layout line** as shown. When the engraved mark and the layout line coincide, turn the **thumb screw** to lock the template in place. Referring to Fig. 12 align the **pointer** in the center of the jig with the second **layout line**. Then turn the **clamping knob** so that the jig is secured to the stock with the template centered over the layout lines.



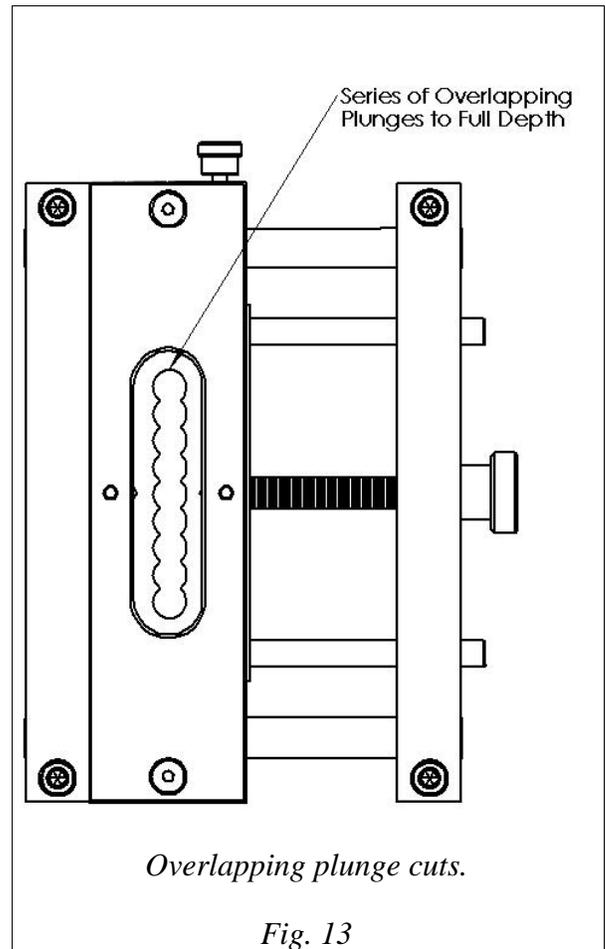
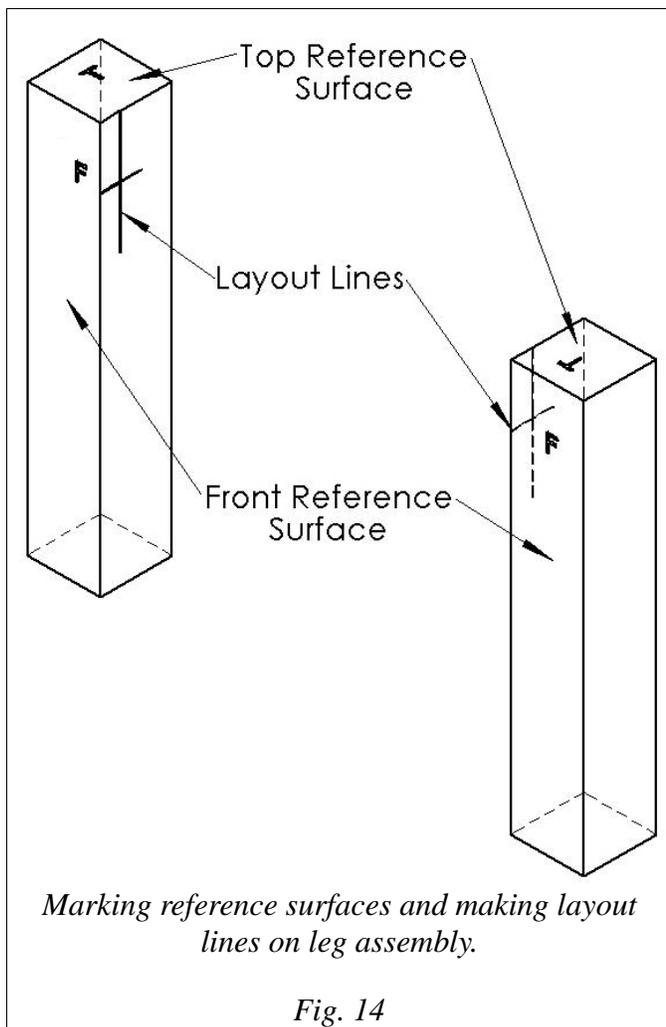
**Step 4.** Proceed to rout the mortise with your plunge router fitted with a 5/8" template guide. Referring to Fig. 13,



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the recommended technique for routing the mortise is to make a series of overlapping plunges to full depth along the length of the template. Then make a finishing cut by moving your plunge router around the template. As mentioned, the template is sized 1/64" larger than the diameter of a 5/8" template guide allowing you to use this technique. This technique is fast and produces a mortise with an excellent surface finish on the walls. Just remember that your mortise will be 1/64" larger than the bit diameter.

Note, waste chips will accumulate while routing the mortise. You may need to periodically stop routing and remove this



waste. A shop vacuum works well.

## Tips and Techniques:

### Practice first:

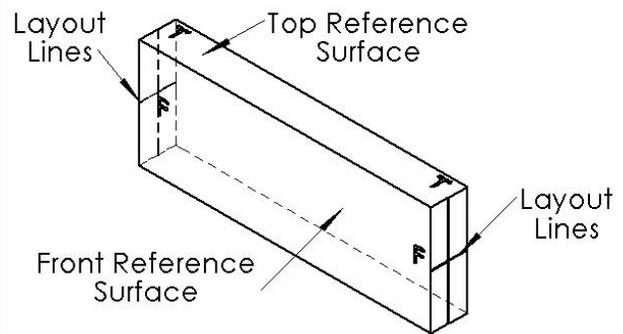
Practice using the jig on scrap pieces of material before using it on expensive stock.

**Use A Marking gauge:** Using a marking gauge or similar precision marking tool when making layout lines will ensure consistency and create accuracy in your joinery.

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## Layout From Common Reference Surfaces:

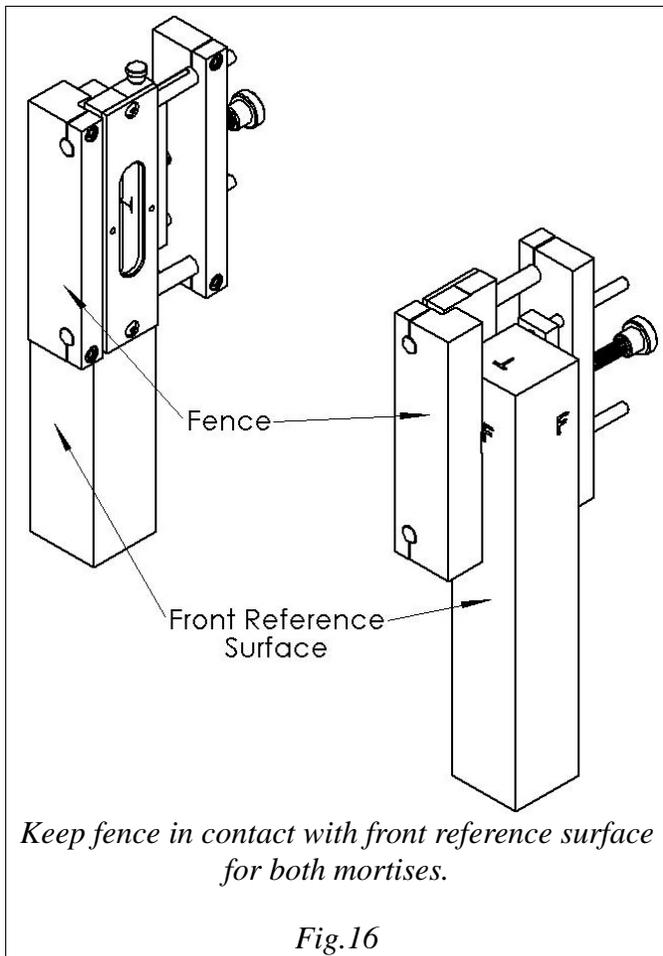
Making layout lines from common reference surfaces on your stock will ensure that your mortises are accurately located. Fig. 14 shows two legs to be joined in a table assembly. The legs share common reference surfaces that have been marked with the letters "F" and "T". The front reference surface has been marked with the letter "F" on each leg. And the top reference surface has been marked with the letter "T" on each leg. Layout lines have been made on each leg referenced from those surfaces. The resulting mortises made using the layout lines will be perfectly aligned with each other. Fig. 15



*Marking reference surfaces and making layout lines on apron*

*Fig. 15*

shows an apron with two sets of layout lines on the end grain. The two sets of layout lines have common reference surfaces marked "F" and "T". The layout lines have been made referenced from those surfaces and the resulting mortises will be perfectly aligned with each other.



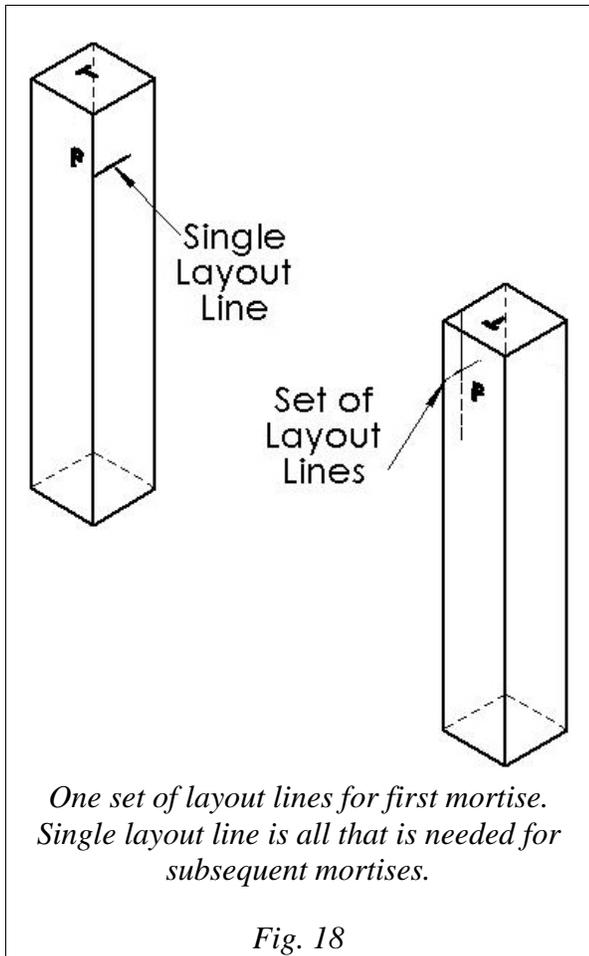
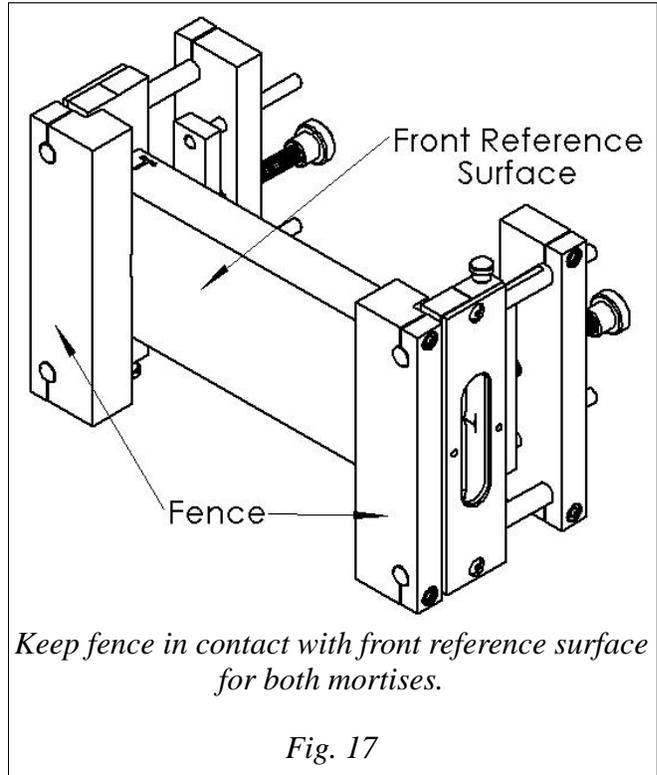
*Fig.16*

## Keep the Fence in Contact With a Common Reference Surface:

Clamping the jig to your stock with the fence in contact with a common reference surface will ensure accuracy. Fig. 16 shows the jig clamped to the leg blanks previously discussed. Notice that the **fence** is in contact with the **front reference surface** for both mortises. Both mortises will be offset the exact same distance from that surface. Note, even if you have set up for mortises that are centered on your stock, it is still good practice to use this technique. Any error in laying out a centered mortise or error in aligning the jig to the layout lines will be negated. Fig. 17 shows

# Mortise Pal™ Mortising Jig User's Manual

the jig clamped to the apron previously discussed. Again notice that the **fence** is in contact with the **front reference surface** for both mortises.



## Reduced Layout for Subsequent Mortises:

It is necessary that the first mortise made have two layout lines that mark its center. Subsequent mortises with the same offset from the front reference surface require only one layout line. Fig. 18 shows the two leg blanks previously discussed. Notice that one leg blank has a **set of layout lines** and the other has just a **single layout line**. The jig will be set up by centering the template over the **set of layout lines** and routing the first mortise. Because the offset is the same on the second mortise only one layout line referenced from surface "T" is required. Align the jig's pointer to the single layout line and rout the second mortise.

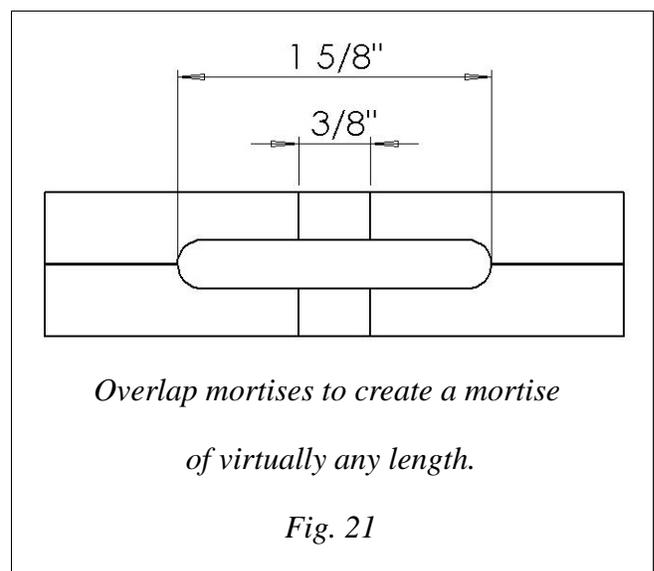
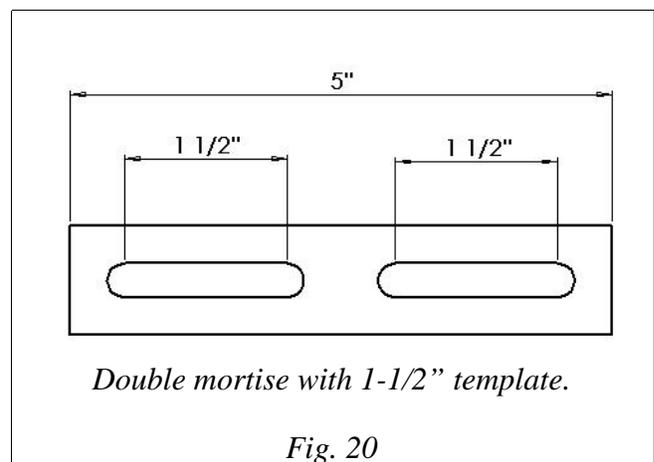
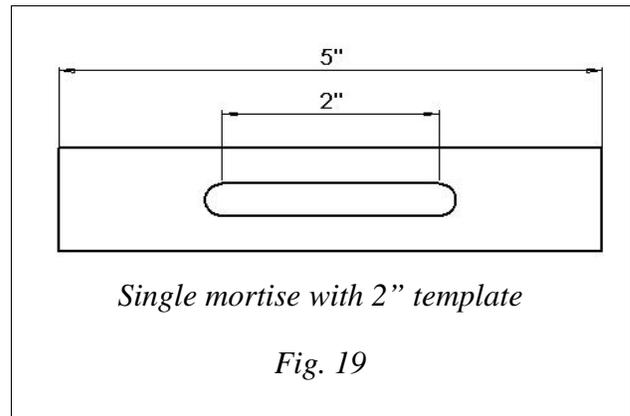
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## Making Multiple Mortises:

Making multiple mortises may be useful when the templates supplied with the jig are not of a length suitable for the width of your stock. For example, Fig. 19 shows a mortise in a 5" wide board using the 2" template. The resulting joint may be prone to twist and/or may not provide enough glue area for a strong joint. Fig. 20 shows the same board with two mortises using the 1-½" template. There is much more glue area and the joint will be less likely to twist.

## Overlapping Mortises:

There may be instances when a mortise needs to be made an exact length that is not possible by the choice of templates included with the jig. In these instances you can make overlapping mortises. For example, making a 1-5/8" mortise with a 1/4" bit is not possible by making a single mortise with one of the included templates. But it can be made by using the 1" template and making two mortises with their centers are spaced 3/8" apart as illustrated in Fig. 21. Notice that two sets of layout lines have been made marking the centers of the overlapping mortises. The rule for calculating the overall length of this mortise is to add the template length, the bit diameter, and the distance between the layout lines. In this example a 1/4" bit was used with a 1" template, and there is 3/8" between layout lines:  $1/4" + 1" + 3/8" = 1-5/8"$ . Note, mortises longer than 2" should be avoided in thin stock. The clamping nature of the jig may cause the thin walls of the mortise to be pressed into the bit. The resulting mortise may taper in width towards its center.

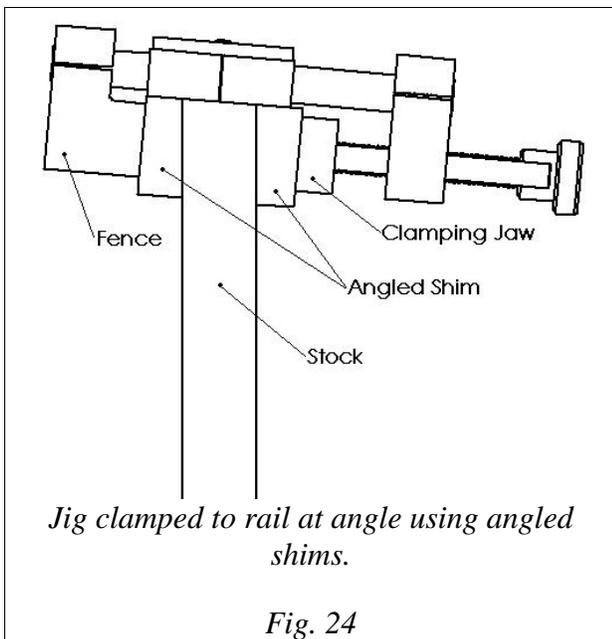
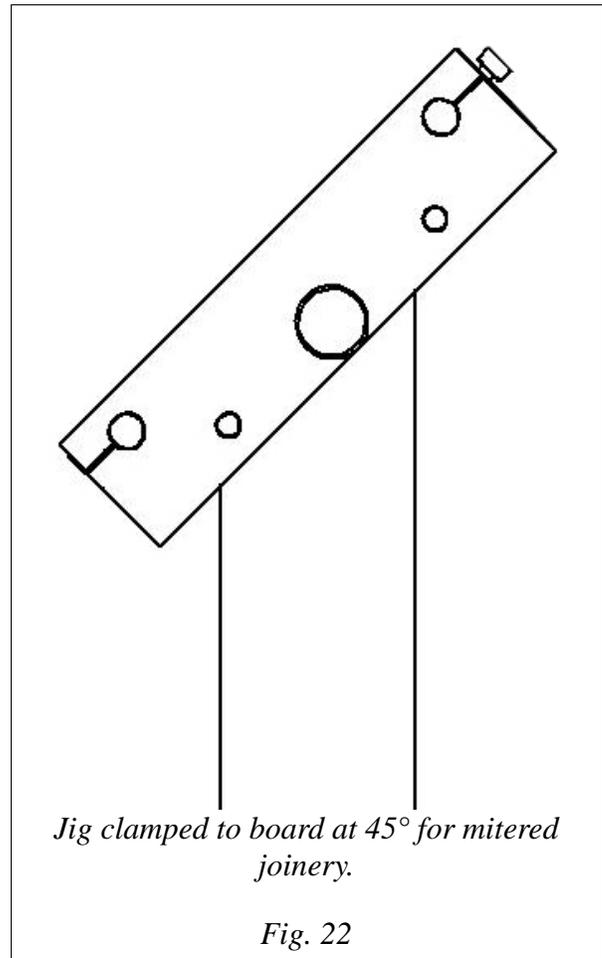
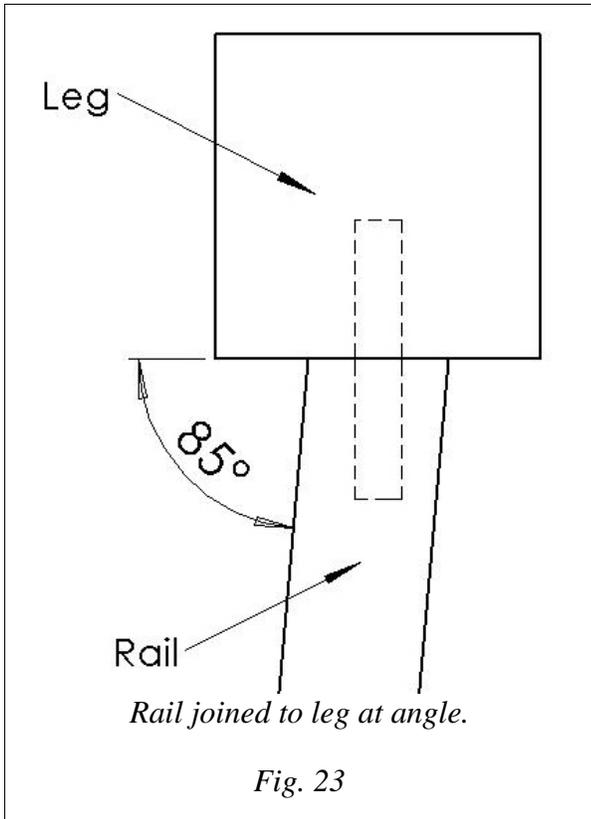


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### Angled Joinery:

Mortise Pal is extremely versatile and can be used to make



angled joinery. Fig. 22 shows the jig clamped to a board at  $45^\circ$  to make a mortise for a mitered joint.

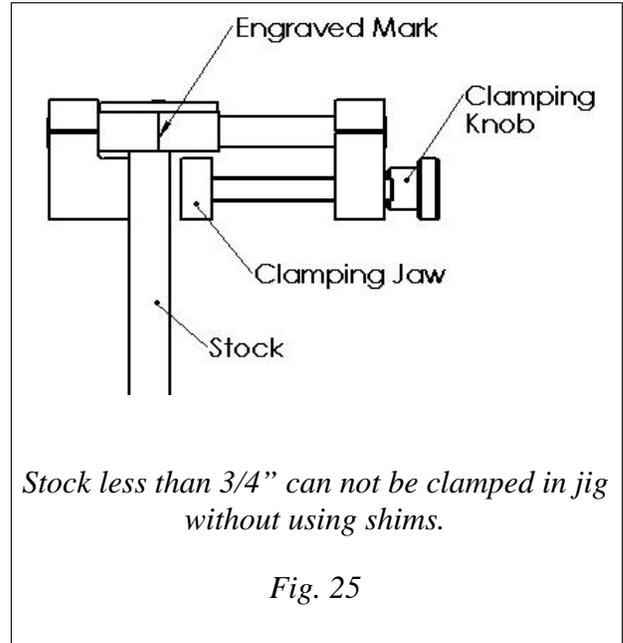
Fig. 23 shows a **rail** joined to a **leg** at  $85^\circ$  such as might be found in a chair. Note that mortises have been made in both parts so that they can be joined with a loose tenon.

Fig. 24 shows the jig clamped to the rail to make an angled mortise. Notice that **angled shims** have been inserted between the **stock** and the jig. The angled shims have been made on the table saw by crosscutting a 1" thick, 5" wide board with the blade at  $5^\circ$ .

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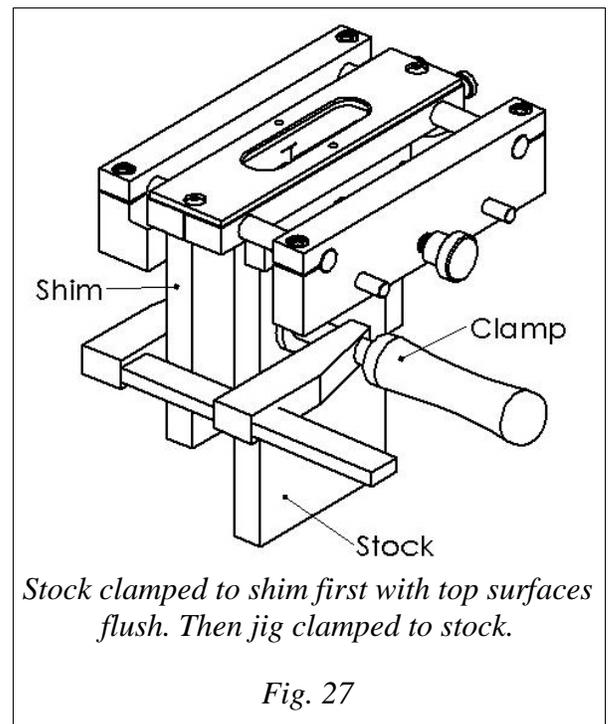
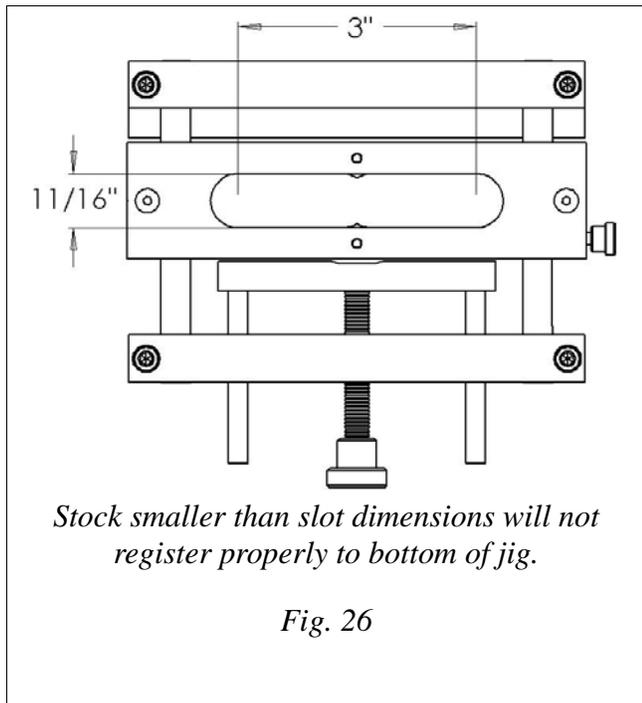
## Mortising in Stock Thinner than 3/4”:

Fig. 25 shows that stock thinner than 3/4” can not be clamped in the jig without the use of shims. Notice that the **clamping jaw** does not contact the **stock** when the **clamping knob** is fully turned. Also notice that the **engraved mark** used to center the template over layout lines can *not* be centered on the thickness of this stock, therefore it would not be possible to make a mortise centered on the thickness of this board.



Additionally, Fig. 26 shows that the slot in the jig body is 11/16” wide x 3” long. Stock that is less than 11/16” thick *and* less than 3” long would not register properly with the bottom of the jig. With these considerations in mind, the recommended technique for mortising in stock thinner than

3/4” is to make a shim that is at least 1/2” thick, 5” wide and long enough that the stock can be clamped to it. Fig. 40 shows the **stock** clamped to the **shim** with the top of the shim and the top of the stock flush. Then the jig has been clamped so that the top of the shim is registered to the bottom of the jig.



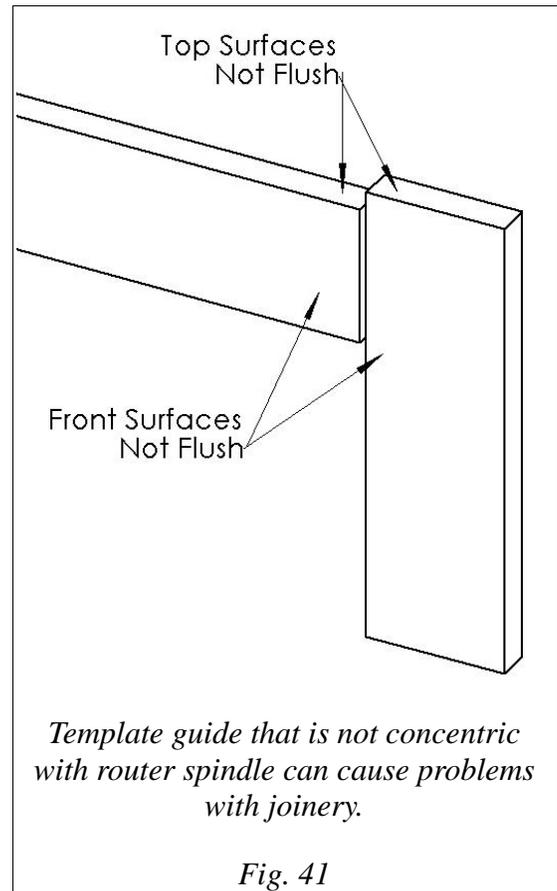
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## Compensating for a template guide that is not concentric with your router spindle:

If your template guide included a centering pin it is highly recommended that you use it to perfectly center your template guide with your router spindle. A template guide that is not concentric with the router spindle can cause problems with your joinery. Fig. 28 shows that the **front surfaces** of your boards may not join flush, assuming that you intended them to, or the **top surfaces** of your boards may not join flush, or both. A tip for compensating for this problem is to orient your router the same way with respect to the jig for each mortise you make. For example always keep your left hand on the same side of the jig as the jig's clamping knob. You might also make a mark or place a sticker on your router base plate as well as on the jig to help you in maintaining this orientation. Note, this will only correct problems with registration of the front surfaces as shown in Fig. 41 and does not help with the top surfaces.

## Making Loose Tenon Stock:

Making perfect fitting loose tenon stock is best accomplished by using a thickness planer and a set of calipers. Using calipers and the lead screw that adjusts the cutter height on a thickness planer gives you great accuracy in making tenon stock that is exactly the right thickness. First, rip stock on a table saw so that it's width is just slightly smaller than the length of your mortise. 1/32" is good. Then measure the mortise width with the calipers and begin bringing the tenon stock to thickness on the planer. Periodically check the thickness with the calipers. Adjust the cutter height as necessary by calculating the number of turns that must be made to bring the tenon stock to final thickness. Then round over the edges of your stock using a router table. Finally, cross cut the tenon stock to length based on the depth of the mortise leaving a little space for glue.



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### **Maintenance:**

The jig requires very little maintenance. To remove dust and debris from the jig use compressed air, a soft bristle brush or a dry rag. Periodically place a drop of lubricant or tool oil on the four stainless steel guide rods.

### **Warranty:**

R.G. Jig Co. stands behind its products with a one-year limited warranty. If you have any questions regarding the warranty you can contact Customer Service by email at [support@mortisepal.com](mailto:support@mortisepal.com) or by calling 619-459-7951.

### **Coverage:**

R.G. Jig Co. warrants that this product is free of defects in factory workmanship and materials during normal use. If this product fails during normal use because of such a defect, R.G. Jig Co. will, at its option, repair or replace, free of charge, any part or parts shown to be so defective.

### **Excluded from Coverage:**

Failure resulting from alteration, modification, misuse, abuse or neglect or after repairs have been attempted or made by others.