Woodsmith PLANS

Plate Joiner Table

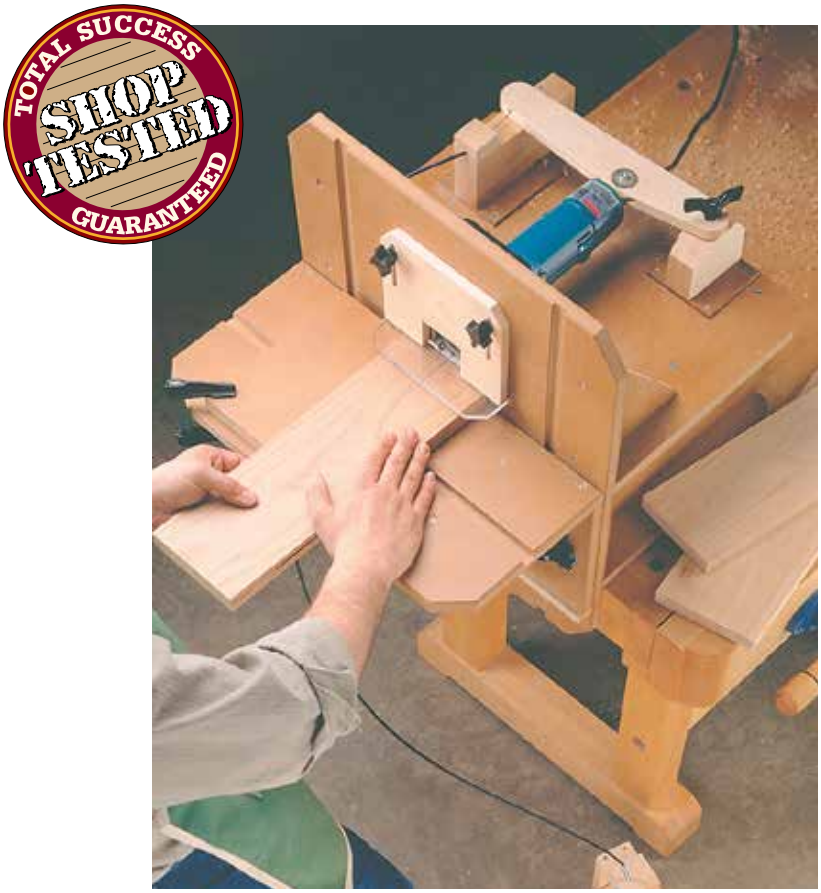


Plate Joiner Table

This simple shop-built table converts your plate joiner into a handy benchtop tool.

It's hard to imagine a quicker way to join two pieces together than to use a plate joiner. In fact, cutting the slots for the wood plate (biscuit) actually takes less time than clamping and unclamping the workpieces.

This constant fiddling with clamps can get to be a nuisance. Especially if I need to cut slots in a number of workpieces. So to make it easy to cut a slot without having to first secure the workpiece, I mounted my plate joiner to a table that clamps to my bench, see photo above.

The biggest advantage to doing this is it frees up *both* hands to hold the workpiece. But that presents another problem — how do you plunge the blade of the plate joiner into the workpiece to cut a slot?

PLUNGE SYSTEM. The solution is a simple plunge system that consists of a foot pedal and a wood arm.

When you step on the foot pedal, a wire cable pulls on the arm that's located on the plate joiner table, see inset photos above. As a result, the arm pivots against the body of the plate joiner and pushes it forward. This plunges the blade of the plate joiner into the workpiece which cuts a slot for the biscuit.

SLIDING TABLE. The up and down location of this slot is determined by the position of a large sliding table, see photo below. Depending on the thickness of the workpiece, you just raise or lower the table so the blade will cut at the desired height. With the table locked in place, it provides a large, stable worksurface.

QUICK RELEASE. One last thing. If you're working with an extremely large piece that's awkward to handle on the sliding table, it's easy to remove the plate joiner and use it in a hand-held position, see photo below left.

***Quick Release**. If you want to use the plate joiner in a hand-held position, simply loosen a pair of hold-downs and remove the pivot arm.*

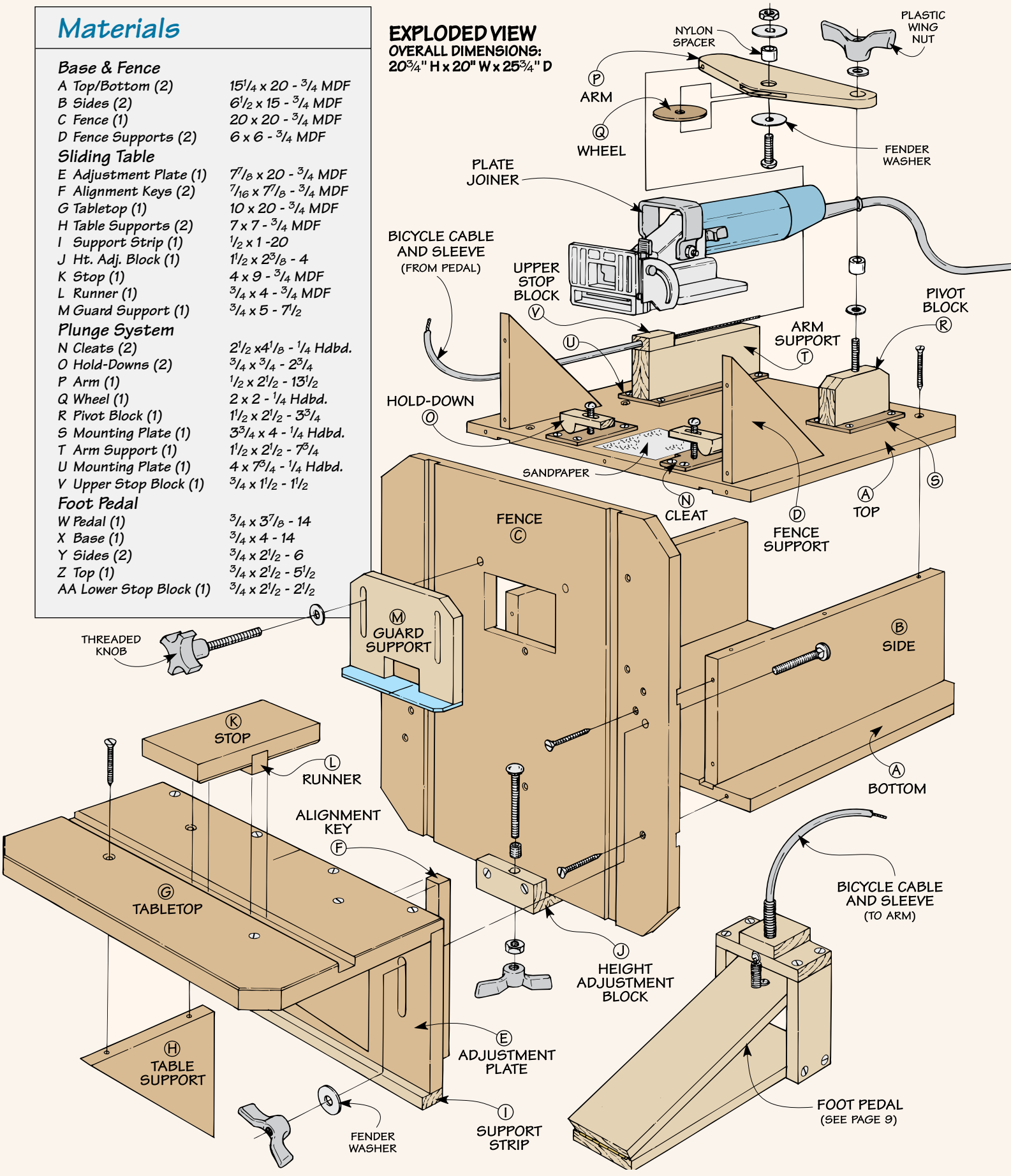
***Sliding Table.** A built-in height adjustment mechanism raises or lowers a sliding table. This establishes the location of the slot that's cut for the biscuit.*

Materials

Base & Fence	
A Top/Bottom (2)	15¼ x 20 - ¾ MDF
B Sides (2)	6½ x 15 - ¾ MDF
C Fence (1)	20 x 20 - ¾ MDF
D Fence Supports (2)	6 x 6 - ¾ MDF
Sliding Table	
E Adjustment Plate (1)	7⅞ x 20 - ¾ MDF
F Alignment Keys (2)	7/16 x 7⅞ - ¾ MDF
G Tabletop (1)	10 x 20 - ¾ MDF
H Table Supports (2)	7 x 7 - ¾ MDF
I Support Strip (1)	½ x 1 -20
J Ht. Adj. Block (1)	1½ x 2⅜ - 4
K Stop (1)	4 x 9 - ¾ MDF
L Runner (1)	¾ x 4 - ¾ MDF
M Guard Support (1)	¾ x 5 - 7½
Plunge System	
N Cleats (2)	2½ x4⅛ - ¼ Hdbd.
O Hold-Downs (2)	¾ x ¾ - 2¾
P Arm (1)	½ x 2½ - 13½
Q Wheel (1)	2 x 2 - ¼ Hdbd.
R Pivot Block (1)	1½ x 2½ - 3¾
S Mounting Plate (1)	3¾ x 4 - ¼ Hdbd.
T Arm Support (1)	1½ x 2½ - 7¾
U Mounting Plate (1)	4 x 7¾ - ¼ Hdbd.
V Upper Stop Block (1)	¾ x 1½ - 1½
Foot Pedal	
W Pedal (1)	¾ x 3⅞ - 14
X Base (1)	¾ x 4 - 14
Y Sides (2)	¾ x 2½ - 6
Z Top (1)	¾ x 2½ - 5½
AA Lower Stop Block (1)	¾ x 2½ - 2½

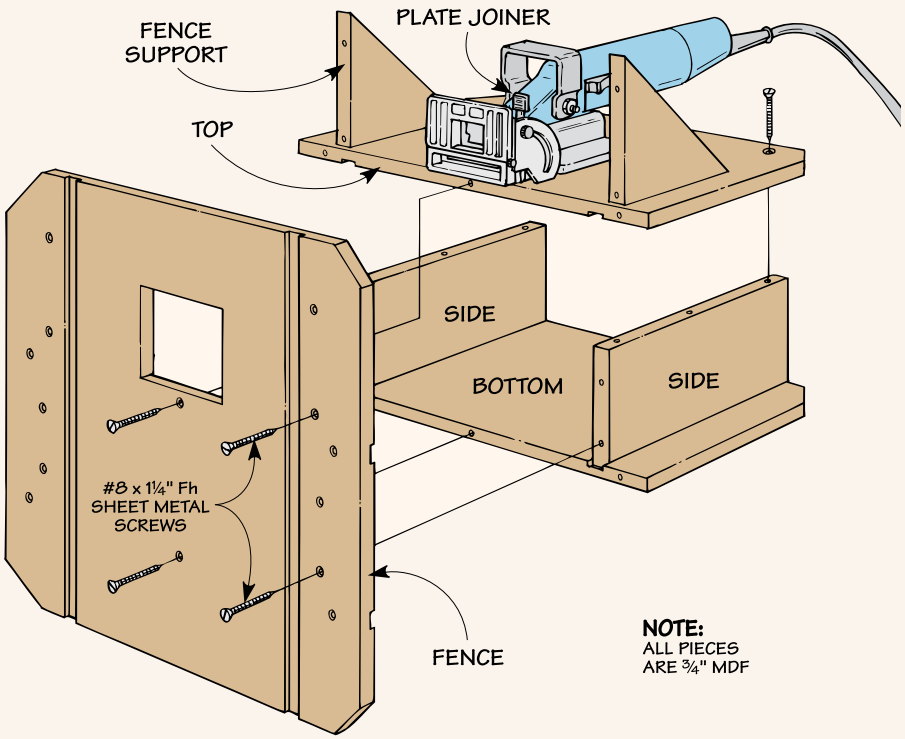
EXPLODED VIEW

OVERALL DIMENSIONS:
20¾" H x 20" W x 25¾" D



Base & Fence

I began work on the plate joiner table by building a base and a fence. The base provides a sturdy platform for the plate joiner, see drawing at right. And a tall fence supports the workpiece when making a cut.



BASE

The base is a simple box made from ¾"-thick Medium Density Fiberboard (MDF). An opening in the back of the base provides a place to store the foot pedal, see margin.

When you're not using the plate joiner table, just slide the foot pedal into the opening at the back of the base.

TOP & BOTTOM. The base consists of a top and bottom that are held together by two sides. To create a clamping surface for securing the base to the bench, the sides fit in grooves that are set in from the edges of the top and bottom.

To ensure these grooves align, I started with a large blank that's cut to final width, but oversize in length, see Fig. 1.

Once the grooves are cut in the blank, you can cut the *top* and *bottom (A)* to final length. While I was at it, I cut an angled notch in the back corner of each piece, see Fig. 1.

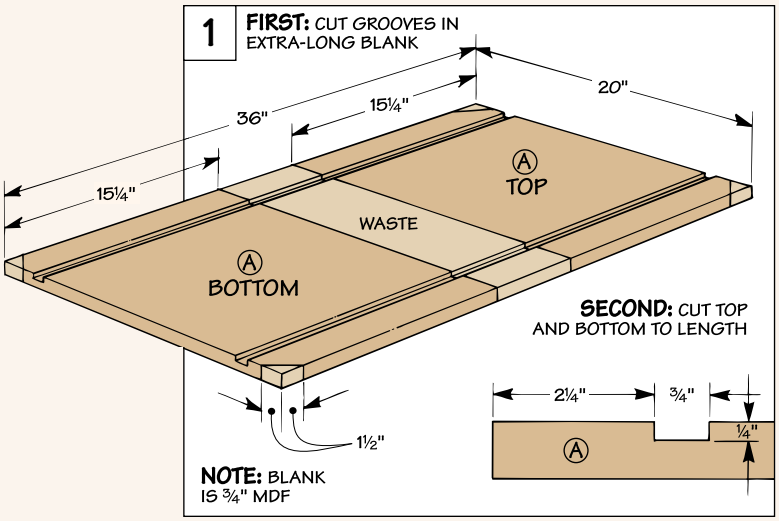
SIDES. All that's left to complete the base is to add the two *sides (B)*, see Fig. 2. One thing to be aware of here is the sides are set in ¼" from the front edge of the top and bottom. That's because later on, the top and bottom will fit into dadoes in the back of the fence, refer to Fig. 5. And this ¼" offset will allow the sides to fit tight against the back of the fence.

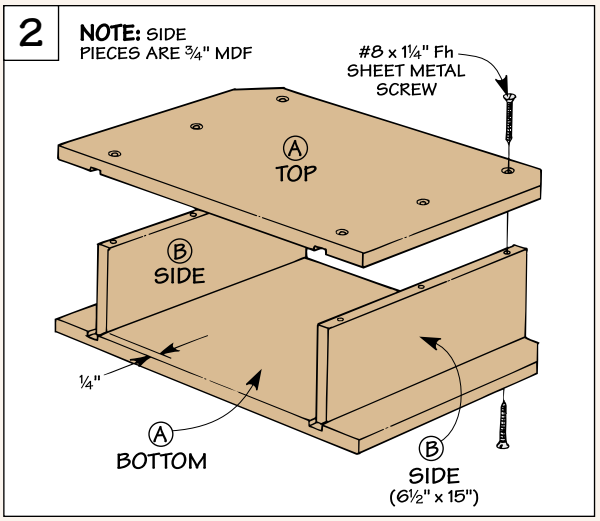
After cutting the sides to size, the base is simply glued and screwed together, see Fig. 2. Note: To prevent the MDF from splitting, I used sheet metal screws with straight shanks.

FENCE

With the base complete, you can turn your attention to the fence. In addition to providing support for the workpiece as you make a cut, the fence guides the sliding table up and down.

GROOVES. The way this works is simple. There are two grooves in the *front* of the fence that align with grooves in the *back* of the





sliding table. A pair of keys (added later) that fit into these grooves will "track" the sliding table up and down the fence.

To get the table to slide smoothly (and evenly), it's important that these grooves align. So it's best to start with a single blank and cut the grooves in the *fence (C)* and the adjustment plate (E) for the sliding table at the same time, see Fig. 3.

Now it's just a matter of cutting both pieces to final length. After setting aside the adjustment plate, I cut an angled notch on each corner of the fence as before, see Fig. 4.

DADOES. The next step is to cut a pair of shallow dadoes in the back of the fence, see Fig. 4. These dadoes accept the top and bottom of the base.

OPENING. But before you attach the base, there's one last thing to do. That's to cut an opening in the fence for your plate joiner that allows the blade to plunge into the workpiece, see Fig. 4.

When determining the size of the opening, the goal is to make it large enough so the face of the plate joiner will sit flush with the front of the fence. So you want to check that there's enough clearance for any knobs or levers on the plate joiner. (I sized it to provide a 1/8" clearance all around.)

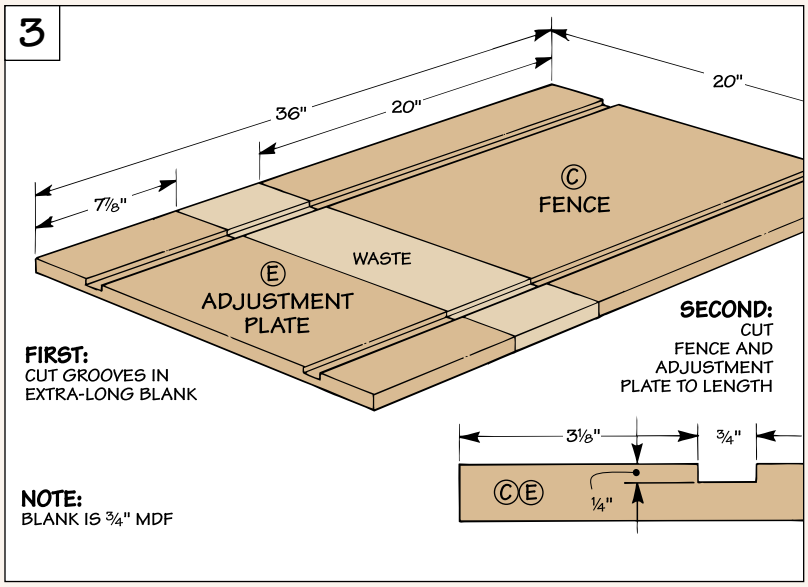
Once you've established the size, you're ready to lay out the opening. I centered it on the width of the fence and located it so the bottom of the opening is flush with the top dado, see Fig. 4.

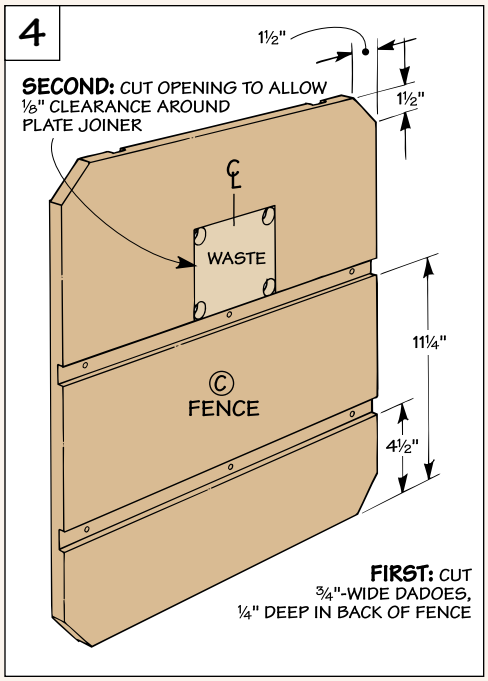
An easy way to cut the opening is to drill a hole in each corner and remove the waste with a sabre saw.

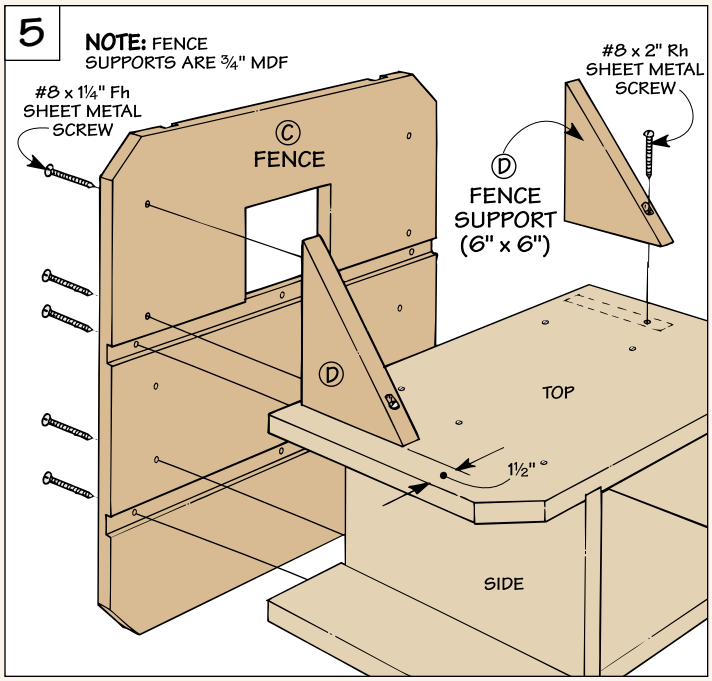
ATTACH FENCE. With the fence complete, you're ready to attach it to the base. To help strengthen the fence and keep it square to the base, I added two triangular *supports (D)*, see Fig. 5.

These supports are screwed to the fence from the front. But to attach them to the base, you'll need to drill a counterbored shank hole in the angled edge of each support.

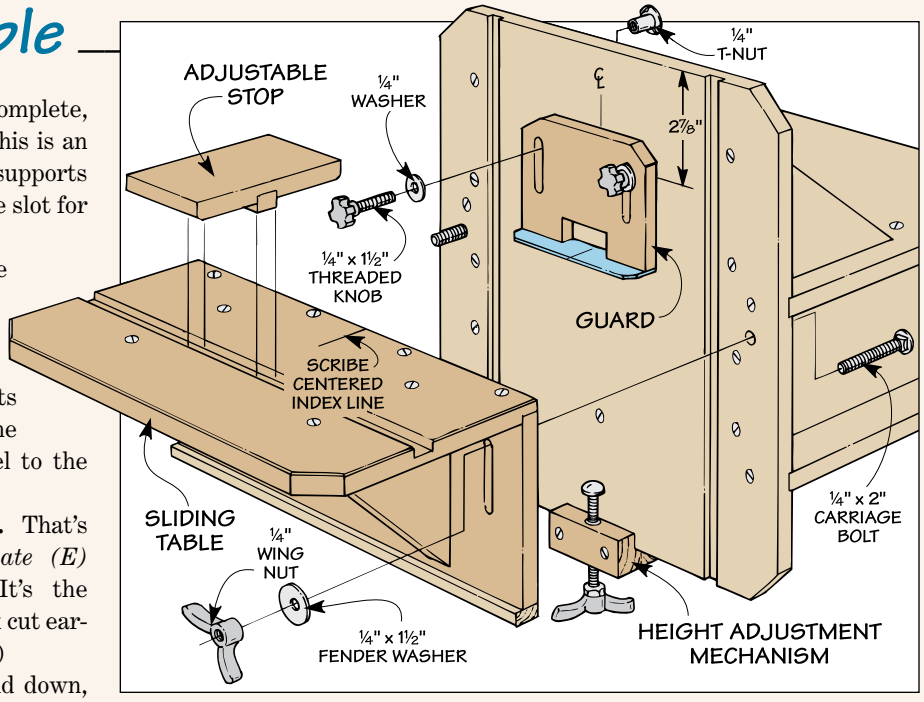
Once you've drilled all the holes, the only thing left is to glue and screw the pieces together.







Sliding Table



With the base and fence complete, I added the sliding table. This is an L-shaped assembly that supports the workpiece as you cut the slot for a biscuit.

The height of the table determines the location of this slot on the *thickness* of the workpiece. To ensure the matching slots in two workpieces align, the table has to remain parallel to the blade of the plate joiner.

ADJUSTMENT PLATE. That's where the *adjustment plate (E)* comes in, see Fig. 6. (It's the remaining piece of the blank cut earlier when making the fence.)

To guide the table up and down, a pair of *alignment keys (F)* fit in grooves in the back of the adjustment plate. Since these grooves were already cut earlier, completing the adjustment plate is just a matter of cutting a pair of slots and gluing in the keys (F).

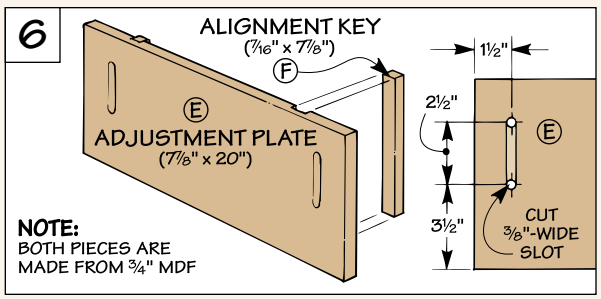
TABLETOP. At this point, you can set aside the adjustment plate and start on the *tabletop (G)*, see Fig. 7. It's just a piece of ¾" MDF that's rabbeted along the back edge to fit the adjustment plate.

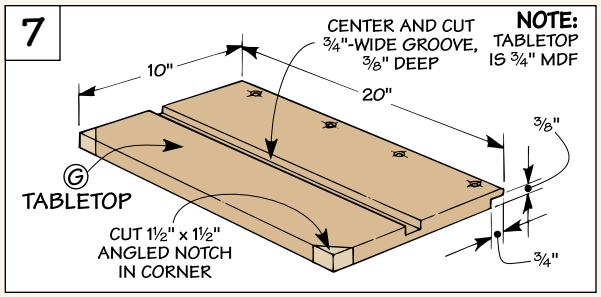
To accept a stop that's added later, you'll need to cut a centered groove in the tabletop. And to avoid chipping the top edges with a workpiece, I routed a slight (⅛") chamfer around the top edges. (The chamfer along the back edge acts as a dust relief.)

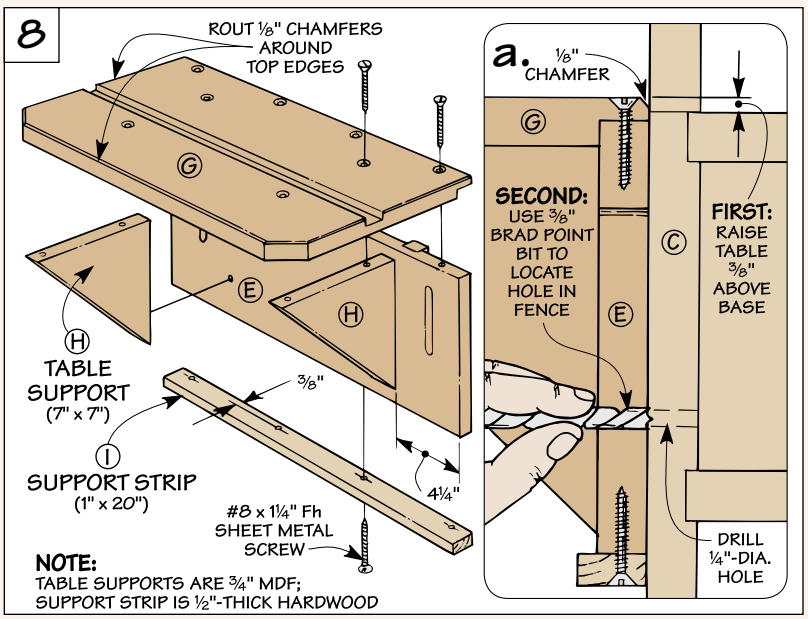
ATTACH TABLETOP. After trimming the front corners of the tabletop at an angle, you can attach it to the adjustment plate. Here again, a pair of large triangular *supports (H)* add rigidity to the table, see Fig. 8.

SUPPORT STRIP. There's just one more thing to do before mounting the sliding table to the fence. To provide a solid bearing surface for a height adjustment bolt (added later), a thin, hardwood *support strip (I)* is glued and screwed to the bottom edge of the adjustment plate, see Fig. 8.

MOUNT TABLE. Now you can mount the table to the fence. It's held in place by two carriage bolts that pass through holes in the fence and the slots in the adjustment plate. Tightening a wing nut on the end of each bolt locks the table in place.







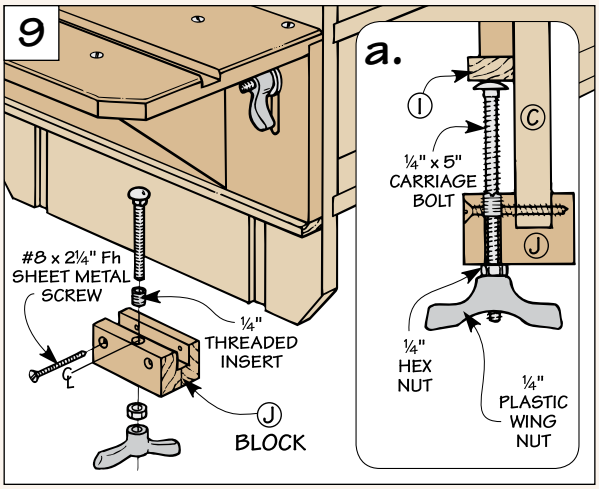
When determining the location of the holes for these bolts, there's one thing to keep in mind. To avoid accidentally cutting into the table, you want to establish the *maximum* height that it can be raised.

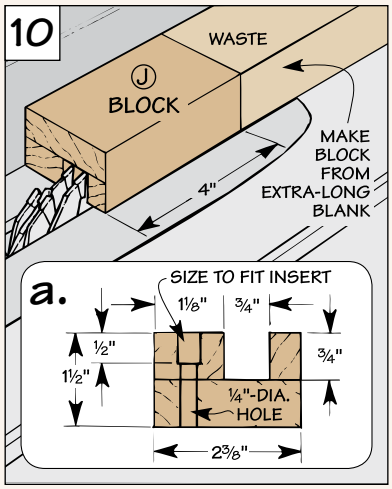
An easy way to do this is to temporarily clamp the table in place so it's 3/8" *above* the top of the base, see Fig. 8a. Then just mark the *bottom* of the adjustment slots.

HEIGHT ADJUSTMENT. With the sliding table in place, you still need a way to move it up and down. That's the job of the height adjustment mechanism.

What makes it work is an ordinary carriage bolt. It threads into an insert that's installed in a wood block attached to the fence, see Fig. 9. The head of the bolt rests against the support strip (I) on the adjustment plate, see Fig. 9a. When you turn a wing nut that's tightened against a nut on the end of the bolt, the head raises (or lowers) the table.

Since the *block (J)* that holds the height adjustment mechanism is small, it's best to start with a long blank, see Figs. 10 and 10a. (I glued up two hardwood pieces.) After cutting a groove to fit the fence and drilling holes for the threaded insert and bolt, just screw the block in place, see Fig. 9a.





Adjustable Stop & Guard

To make it easier and safer to use the plate joiner table, I added two accessories: an adjustable stop and a blade guard, see drawing on opposite page.

STOP. If you're cutting a slot in end grain, the rotation of the blade will have a tendency to kick the workpiece to the side. To prevent this, a simple stop is clamped to the table, see margin.

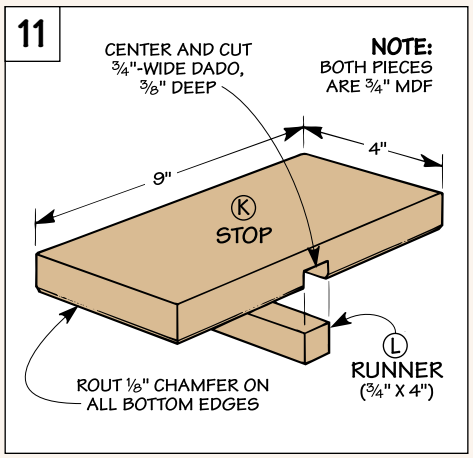
The *stop (K)* is a piece of MDF with a *runner (L)* that fits the groove in the tabletop, see Fig. 11. The runner is simply glued into a dado that's cut in the stop.

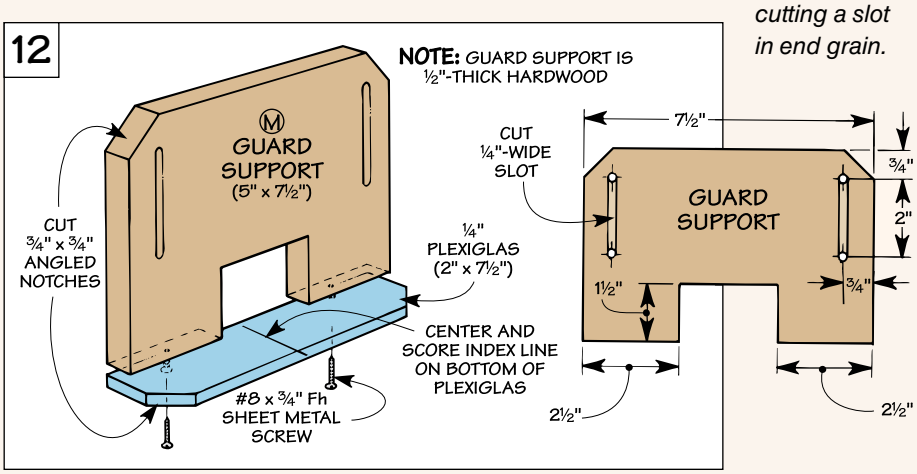
GUARD. The second accessory is a guard that protects your fingers when cutting a slot in the end or edge of a workpiece. The guard is an L-shaped assembly that consists of a hardwood *guard support (M)* and a piece of Plexiglas, see Fig. 12.

Before screwing the pieces together, you'll need to cut two slots to make the guard adjustable. And a square notch helps visibility. Also, scribing a centered index line on the Plexiglas and filling it with ink will make it easy to position a workpiece when cutting a slot.

After attaching the guard to the fence with T-nuts and threaded knobs, I scribed another index line in the tabletop, see drawing on page 5.

An adjustable stop and blade guard provide safer cuts — especially when cutting a slot in end grain.





Plunge System

Holes in the base of this DeWalt joiner can be used to screw it directly in place.

With some plate joiners (like this DeWalt), you'll need to position the arm below the power cord.

The heart of the plate joiner table is a system that plunges the blade of the plate joiner through the opening in the fence.

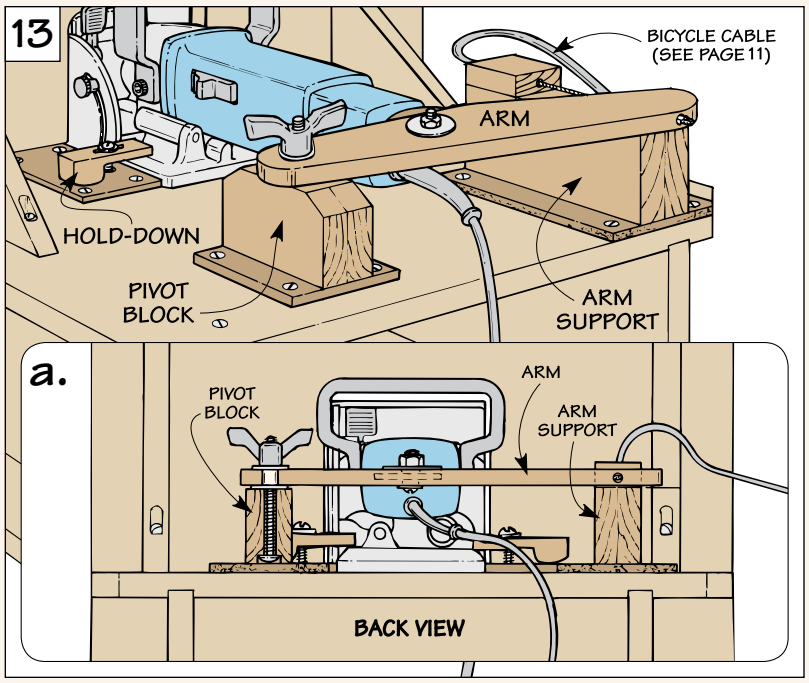
This requires two things: a way to secure the plate joiner to the base, and an arm that applies pressure against the back of the joiner, see Fig. 13.

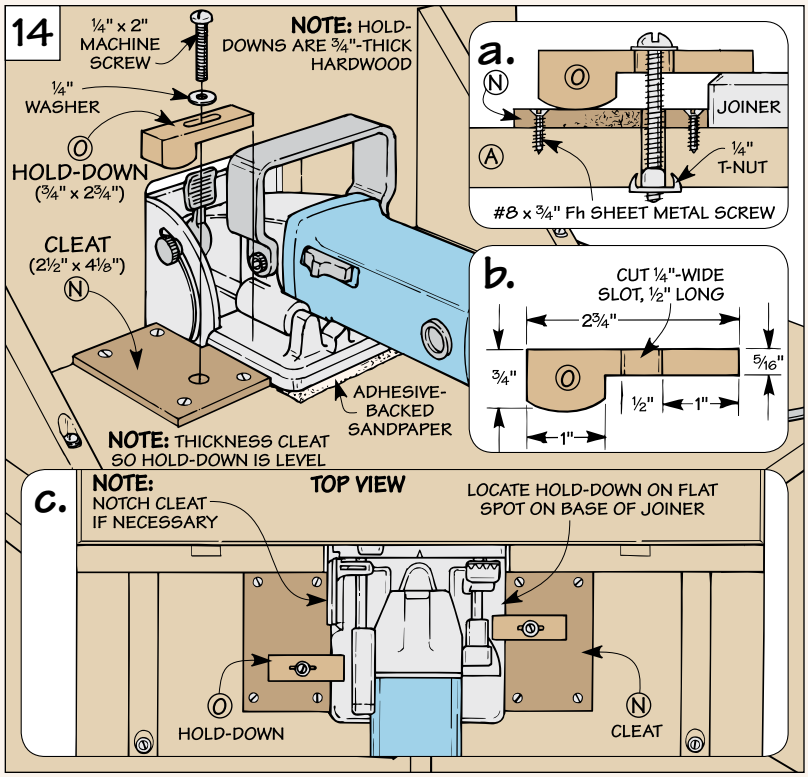
CLEATS. To keep the plate joiner from moving from side to side, a pair of hardboard *cleats (N)* fit against the base of the plate joiner, see Fig. 14. Note: Depending on your plate joiner, you may be able to mount it directly to the base, see top margin photo.

HOLD-DOWNS. In addition to the cleats, I added two whistle-shaped *hold-downs (O)* to apply downward pressure on the plate joiner, see Fig. 14b.

The curved end of each hold-down rests on the cleat, see Fig. 14a. And the opposite end sits flat on top of the base of the plate joiner. When you apply pressure on the hold-down, it rocks on its curved end and pinches the flat end tight against the plate joiner.

This clamping pressure is produced by a machine screw that passes through a slot in the hold-down and into a T-nut installed in the base.





ARM. Once the plate joiner is mounted to the base, you can start on the *arm (P)*, see Fig. 15. It's a thin piece of hardwood that's shaped like a boomerang. This shape provides a single point of contact so the arm can push the body of the plate joiner *forward* and plunge the blade out of the opening in the fence.

A hole drilled in one end of the arm serves as a pivot point. And a counterbored shank hole in the opposite end accepts a cable that connects the arm to the foot pedal.

WHEEL. To reduce wear on the plastic housing of the plate joiner, I added a *wheel (Q)* that spins as the arm pivots, see Fig. 15. It's just a scrap of hardboard that fits into a deep mortise in the arm. The wheel is held in place with a nylon spacer and a lock nut that tightens on a machine screw.

SUPPORT BLOCKS. Before you attach the arm, you'll need to add two support blocks. These blocks raise the arm above the base so it contacts a flat spot on the end of the plate joiner.

PIVOT BLOCK. The arm is secured to the base by means of a thick, hardwood *pivot block (R)* and a

mounting plate (S) made of ¼" hardboard, see Fig. 16.

What's important here is the *combined* height of these two pieces. The idea is to make the pivot block tall (wide) enough so the arm contacts a *flat* place on the end of the joiner. Note: This may be either above or below the power cord, see bottom photo on page 7.

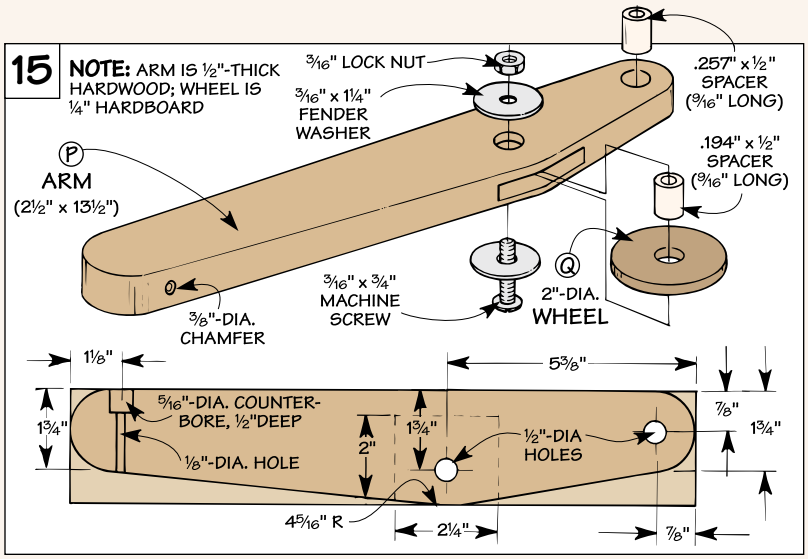
Once the height is established, just glue up two pieces of ¾"-thick stock to make the pivot block. After installing a carriage bolt that will be used to hold the arm in place, the mounting plate is simply screwed to the bottom.

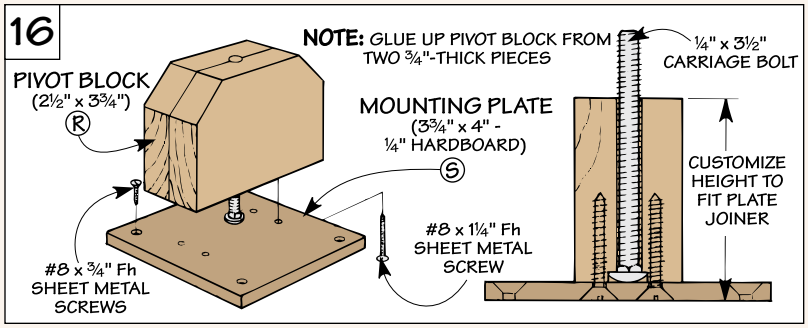
ARM SUPPORT. At this point, you can turn your attention to the arm support. It holds up the "free" end of the arm. And it serves as a platform for the block that the cable passes through.

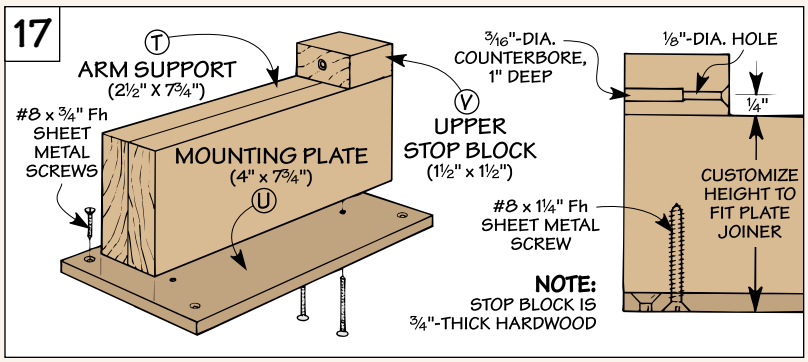
Here again, the *arm support (T)* consists of two glued-up pieces of ¾"-thick hardwood, see Fig. 17. And a ¼" hardboard *mounting plate (U)* is screwed to the bottom. But this time, an *upper stop block (V)* with "stepped holes" drilled in it is glued to the top.

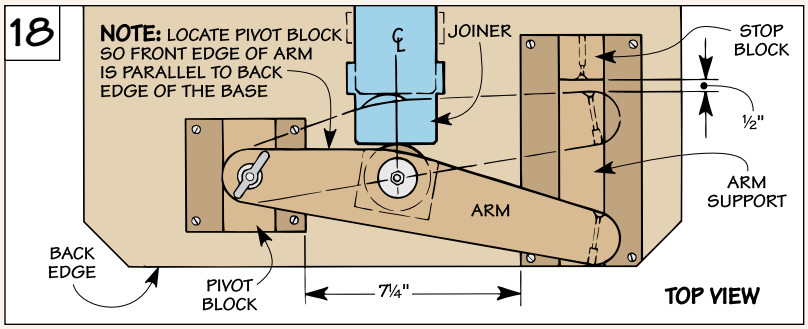
ASSEMBLY. Now you can begin assembling the parts. Attaching the arm is easy. Just slip it onto the end of the carriage bolt in the pivot block and thread on a knob. With the arm in place, you're ready to position the pivot block and arm support.

The goal here is to be able to push the arm all the way forward so it won't "bottom out" on the stop block, see Fig. 18. Note: Set the plate joiner for the maximum depth of cut.









The best way I found to do this is to temporarily clamp the pivot block in place and check the operation of the arm.

Start by positioning the *front* edge of the arm (nearest the pivot point) so it's parallel with the back of the base, see Fig. 18. Also, check that the wheel is centered on the end of the joiner.

Now push the arm all the way forward. (There should be about ½" clearance between the stop block and the arm.) Finally, screw both mounting plates to the base.

Foot Pedal

When you "step on the gas" with this foot pedal, it plunges the blade of the plate joiner into the workpiece.

With the plunge mechanism in place, the last thing to do is add the foot pedal, see photo.

It works like the accelerator pedal on a car. Only this pedal plunges the blade of the plate joiner through the opening in the fence and into the workpiece.

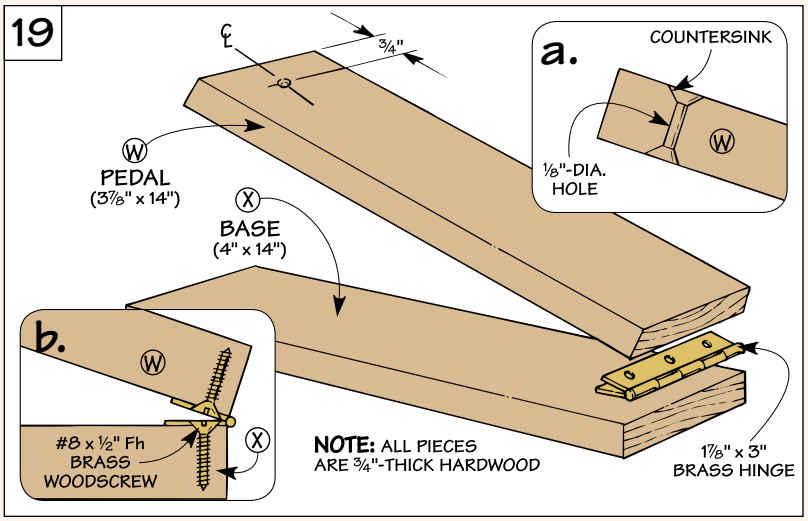
What makes this work is a wire cable that slides inside a flexible sleeve. The cable transfers the movement of the pedal to the arm behind the plate joiner.

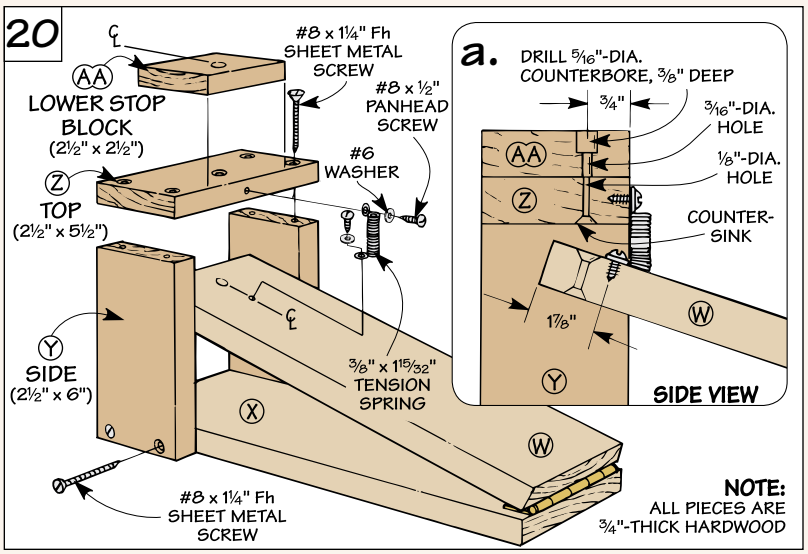
PEDAL. I started work by making a hardwood *pedal (W)* and *base (X)*, see Fig. 19. These pieces are identical in length. But to keep the pedal from binding when a frame is added later, the pedal is 1/8" *narrower* than the base. After drilling a hole in the pedal for the cable (Fig. 19a), just hinge the two pieces together, see Fig. 19b.

FRAME. To provide support for the pedal and base, the next step is to add a wood frame. It consists of two *sides (Y)* that are screwed to the base and a *top (Z)* that holds them together, see Fig. 20.

Before screwing the top in place, you'll need to glue on another *stop block (AA)* and drill a series of "stepped" holes for the cable and sleeve that are added next, Fig. 20a.

CABLE & SLEEVE. There isn't anything unusual about either the cable or the flexible sleeve. (I picked both of them up from the local bike shop.) Just be sure they're long enough so you can put the pedal in a convenient place.





INSTALL CABLE. To install the cable, start by sticking one end through the holes in the foot pedal and fasten it to the end of the pedal (W) with a screw and a lock washer, see Fig. 21. Then slip the sleeve over

Hardware

- (58) #8 x 1 1/4" Fh Sheet Metal Screws
- (2) #8 x 2" Rh Sheet Metal Screws
- (18) #8 x 3/4" Fh Sheet Metal Screws
- (2) #8 x 2 1/4" Fh Woodscrews
- (4) 1/4" Plastic Wing Nuts
- (2) 1 1/2"-Long Threaded Knobs
- (6) 1/4" Flat Washers
- (2) 1/4" x 1 1/2" Fender Washers
- (1) 1/4" x 3 1/2" Carriage Bolt
- (2) 1/4" x 2" Carriage Bolts
- (1) 1/4" x 5" Carriage Bolt
- (1) 1/4" Hex Nut
- (1) 1/4" Threaded Insert
- (4) 1/4" T-Nuts
- (2) 1/4" x 2" Rh Machine Screws
- (1) .257" x 1/2" x Nylon Spacer (9/16"-Long)
- (1) .194" x 1/2" x Nylon Spacer (9/16"-Long)
- (2) 3/16" x 1 1/4" Fender Washers
- (1) 3/16" x 3/4" Rh Machine Screw
- (1) 3/16" Nylon Lock Nut
- (1) 1/16" -Dia. Wire Cable (7 feet)
- (1) Flexible Sleeve (7 feet)
- (1) 1/16" Crimp-On Stop
- (1) 3/8" x 1 15/32" Tension Spring
- (1) 5/16" x 2 13/16" Tension Spring
- (3) #6 x 1/2" Panhead Sheet Metal Screws
- (3) #6 Flat Washers
- (1) #6 External Lock Washer
- (1) 1 7/8" Brass Hinge w/Screws
- (1) 2" x 7 1/2" - 1/4" Plexiglas

For a kit to build the Plate Joiner Table that includes all of the above parts, call 800-347-5105.

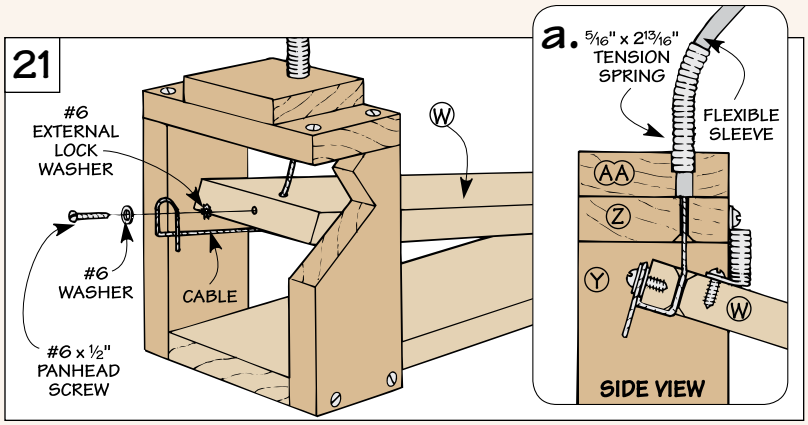
Kit No. 6833-200.....$32.95

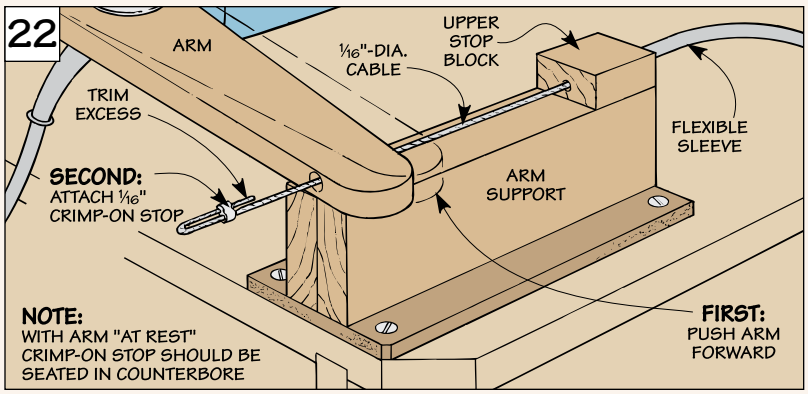
the cable until it "bottoms out" in the stop block. To avoid getting a kink in the cable, slide a spring over the sleeve and push it into the stop block, see Fig. 21a.

SPRING. Before connecting the opposite end of the cable, I attached a spring to the pedal (W) and top (Z). The spring retracts the foot pedal after you step down on it.

CRIMP-ON STOP. There's one last thing to do. That's to run the cable through the upper stop block and arm, then secure it with a crimp-on stop, see Fig. 22.

The goal here is to seat the stop in the counterbore when the arm is "at rest." To do this, you'll need to push the arm forward just a bit. This way, when the spring-loaded base of the joiner pushes the arm back, the stop will be at the correct place.





Making Plate Joints

The plate joiner table makes it easy to cut the slots for a biscuit. And it only takes a few minutes to set it up.

SETUP. Start by clamping the base of the table to your bench. Then raise (or lower) the sliding table so the blade will cut the slot at the desired height.

The up and down location of this slot is determined by the side of the workpiece that's face down on the table. So to ensure that the two mating pieces will be flush *after* they're assembled, you'll want to cut the slots with the "show" side down.

LAYOUT. This means you'll need to mark the layout lines for the joints on the *opposite* side. To do this, simply butt the pieces together and make a mark across the joint line.

When cutting a slot, align each mark with the index line on the guard or the table, see photos.

Edge Joints. *It's easy to cut a slot in the edge of a board. Just align the layout mark for the slot with the index line on the guard. Then hold the work- piece firmly against the fence as you step on the foot pedal.*

End Grain. *You can also cut a slot in the end of a workpiece. Only here, the adjustable stop is clamped to the sliding table so the rotation of the blade doesn't cause the workpiece to "walk" to the side.*

Face Cuts. *To cut a slot in the face of a workpiece, first remove the guard. Then, with the layout mark on the workpiece aligned with the index line on the table, hold the workpiece securely against the tall fence as you make a cut.*