

# WOODWORKER'S WJOURNAL

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## Premium Plan

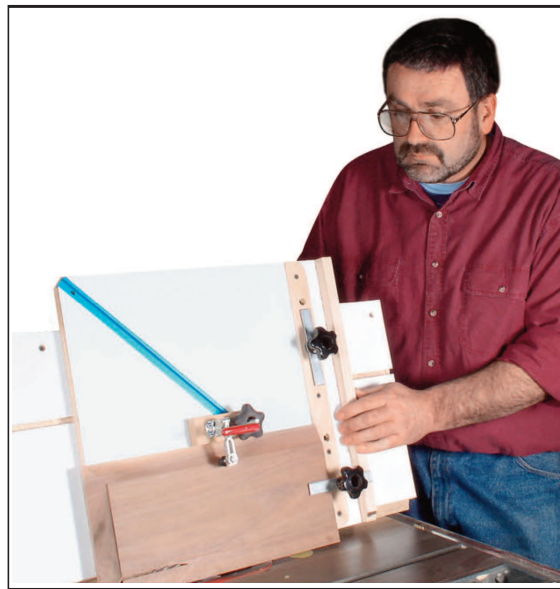
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In this plan you'll find:

- 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.

These plans are best viewed with Adobe Reader installed on your computer. If you want to get a free copy, visit:  
<http://adobe.com/reader>.

## Ultimate Angle Jig





**Material List.** Then chuck a 3/4" straight bit in a table-mounted router and plow a groove in the base at the location shown in the *Elevation Drawings*. This groove will house the T-track (piece 3) and its depth should be half the thickness of the track. I installed the track with epoxy and screws. Stay with the router to mill a dovetailed groove in the the plate (see *Elevation Drawings*). First, use a 1/4" straight bit to remove most of the waste. This makes for an easier second cut with your dovetail bit. The cut should be 3/8" deep by 5/16" wide at its narrowest point.

Now place the base and the plate side-by-side on the workbench with their front edges lined up, and connect them with a surface-mounted continuous hinge (piece 4).

## Ultimate Angle Jig

Creativity often begins at home: While making a whole bunch of raised panel doors for my new kitchen, I came up with this labor-saving adjustable jig. As I moved on to other projects, I found it to be useful for a variety of shop tasks, like creating staves for multi-sided objects and milling spline-grooved mitered edges.

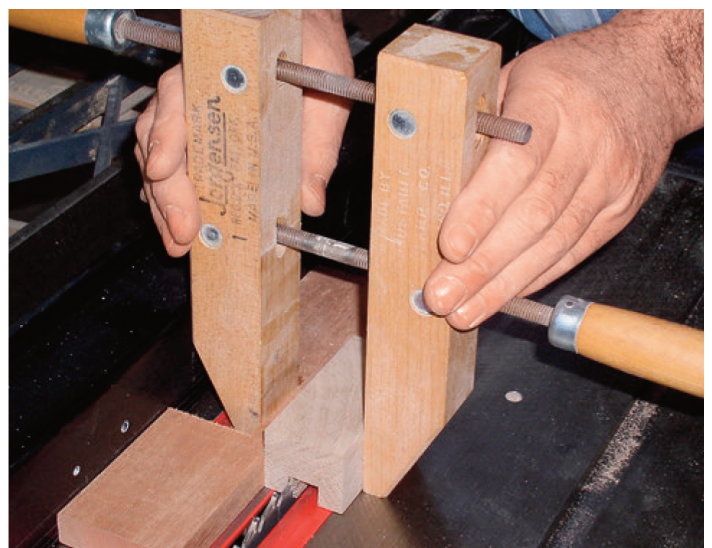
What sets this jig apart is the mechanism which lowers and raises its hinged plate. The arm is attached to the plate and the base with pivots, one of which slides in a T-track, as shown in the *Drawings*. The sled is set up to work safely with small or large parts. A piece of T-track set into a diagonal groove in the sled lets one of the hold-downs handle all kinds of workpiece shapes and sizes. A dovetailed groove keeps the sled (and workpiece) from falling into the blade when the jig is set at high angles.

### Jig Construction

The jig is sized to fit my 10" contractor's saw, so the base (piece 1) measures 30" front to back. Begin construction by cutting the base and the plate (piece 2) to the dimensions given in the

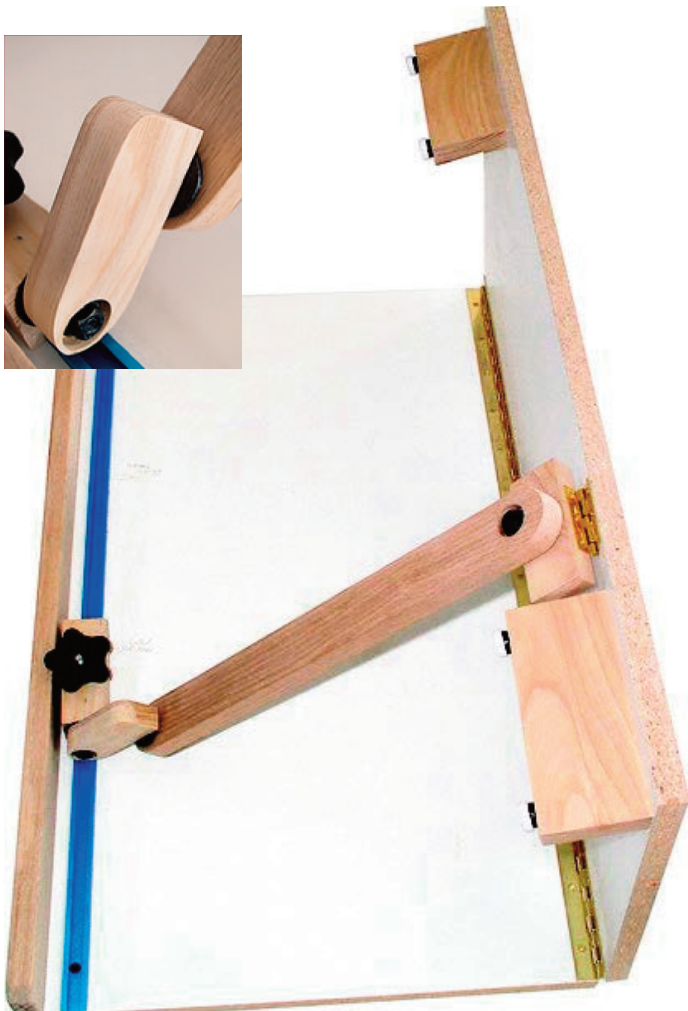
### One Cleat, Two Feet

Next, cut the hardwood fence cleat (piece 5) to size, chamfer the ends on the band saw, and break the edges with sandpaper. Clamp the cleat to the base and secure it with four countersunk 2" screws, driving them into pre-bored pilot holes. This fence cleat answers the question "How do I clamp this thing to my saw's rip fence?" At its lowest point the plate rests at



**Figure 1:** Jig for a jig ... to mill the dado in the arm base, the author clamped it to a larger board (with a handy clamping notch) and nibbled away the dado on the table saw.





**By clever use of pivot hinges and sliding T-track, the author developed a remarkably versatile table saw jig. Making raised panels, repetitive compound angles, splined miter joints ... the list goes on.**

a 10° angle on the base (leaving space for the pivot mechanism) and rests on a couple of feet (pieces 6). To make the feet, crank your table saw blade to 10° and rip one edge of a 3" wide board, then reset the fence and cut the board to its final width. Crosscut the feet to length and secure them to the plate with screws. Now attach a couple of nylon glides (pieces 7) to each foot.

### Making the Pivot Mechanism

The articulating adjustment arm is the heart of the jig's versatility. The first part to make here is the arm (piece 8). Cut it to size, round off the ends on the band saw and touch up the cuts with a stationary disk sander. The top of the arm is attached to a hinged cleat by means of a pivot hinge (pieces 9, 10 and 11). Install the pivot

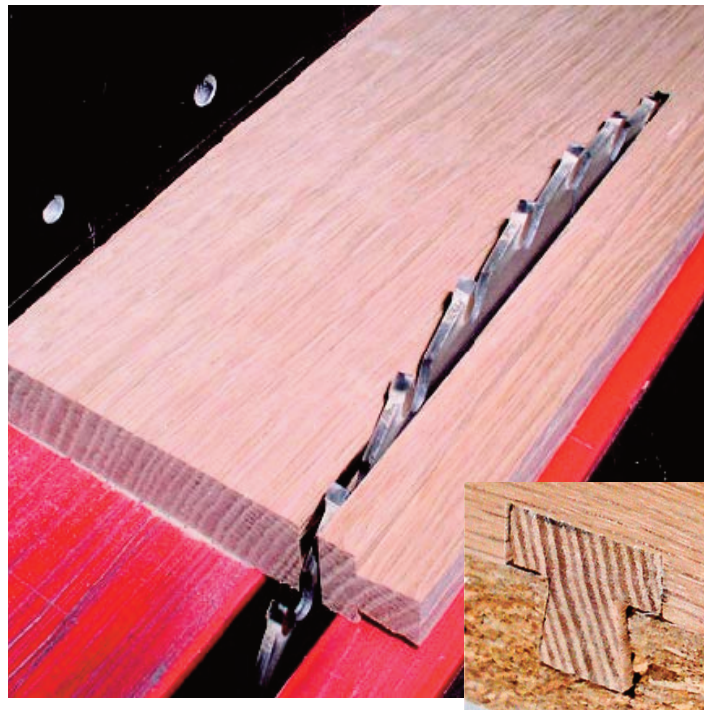
hinge in a two-step counterbore, according to the instructions which accompany it. This secures the arm to the cleat, but hold off on installing the hinge for a few minutes.

### Complete the Arm Assembly

The bottom of the arm is attached to a rotating cleat (piece 12) with another pivot hinge. Cut and shape the cleat, then bore it for the hinge. The rotating cleat in turn is secured to the arm base (piece 13) with a final pivot hinge. Drill the counterbores for this last hinge in the cleat and secure it to the arm.

Face-glue two 4" long pieces of 1 x 2 hardwood, to create a blank for the arm base. After the glue dries, trim it to length, sand the edges and mill a dado in its bottom. Note: I suggest clamping this piece to a longer board and forming the dado in several passes, as shown in *Figure 1*.

Bore for the pivot hinge in one end, then drill a hole for the T-nut (piece 14) at the location shown in the *Drawings*. Slide the T-bolt through



**Figure 2:** Form the dovetail molding on the edge of a larger piece of stock. Check its fit in the dovetail groove. Trim the molding off once the fit is satisfactory.

the arm base and slip the subassembly onto the track. Now finish installing the pivot hinge, which attaches the rotating cleat to the arm base. See the *Exploded View*. Slip a washer (piece 15) onto the T-bolt and wind a fivestar knob (piece 16) onto the T-nut threads. Now you can complete construction of the base by screwing the butt hinge in place.

### **Milling the Dovetail Molding**

You've already begun construction of the sled (piece 17) by cutting it to size and milling a groove in its underside. This latter is designed to house a dovetail molding (piece 18), which is next on the agenda. The safest way to make this small molding is to mill it on the edge of a wider board, then rip it to width (see *Figure 2*). Grab the dovetail bit you used earlier for the groove in the plate and chuck it into a table-mounted router. Set the fence so that only the cutter is protruding past the fence. Lock the bit height at 3/8" and make a pass on each side of your board to create a dovetailed tongue. Test this in the groove: it needs to be snug, but shouldn't bind.

Rip the molding from the edge of the board, trim it to length and glue and clamp it into its groove in the underside of the sled (see *Detail Drawings*).

### **Building the Sled Handle and Fence**

A hardwood handle (piece 19) gives you a solid grip on the sled while operating the jig. Cut this piece to size and break the edges, then glue and screw it to the back edge of the sled. The bottom screw needs to be 3" in from the end, so it never contacts the blade.

A shallow sled fence (piece 20) locates the workpiece on the sled. Joint one edge of a length of 3/4" hardwood, rip it to 3/16" thickness on the table saw in several passes, then complete the machining of the fence.

Put the completed jig base on your table saw, slide the sled into its dovetailed groove and raise

the plate to its maximum height (around 80°). Now use a large framing square to scribe a few lines on the sled at exactly 90° to the bed of the table saw. These will serve as a guide when locating and mounting the fence.

Remove the jig from the saw, and the sled from the base. Clamp the fence to the sled so that the jointed edge is 2-1/2" from the handle, and absolutely parallel to the lines you scribed. Secure the fence to the sled with five 3/4" countersunk screws.

Bore four holes through the fence and the sled at the locations shown in the *Drawings*, and screw four threaded inserts (pieces 21) in place. You can thread a five-star knob (piece 22) into each, and use this to drive the inserts flush with the fence.

### **Making the Hold-downs**

The two metal hold-downs (pieces 23) are just short lengths of steel bar cut to length. They can be used in any of the four threaded inserts. Sand or file the ends to avoid nicking yourself, then drill a hole in the center for the threaded stud on a five-star knob.

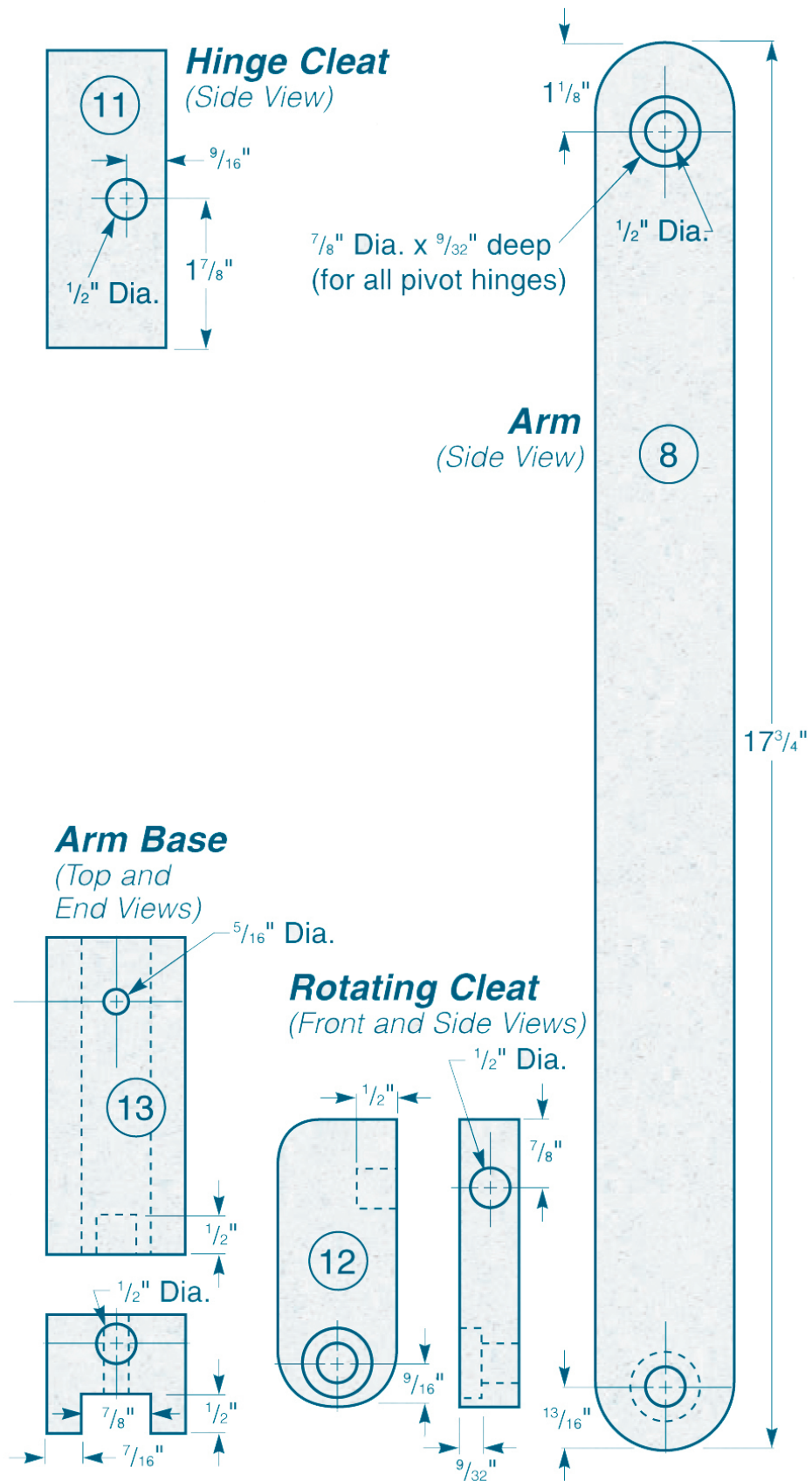
The other hold-down is adjustable to accommodate a wide array of workpiece sizes, so it slides in a length of T-track (piece 24). Plow a groove for the track in the top face of the sled, using a 3/4" straight bit chucked in the router.

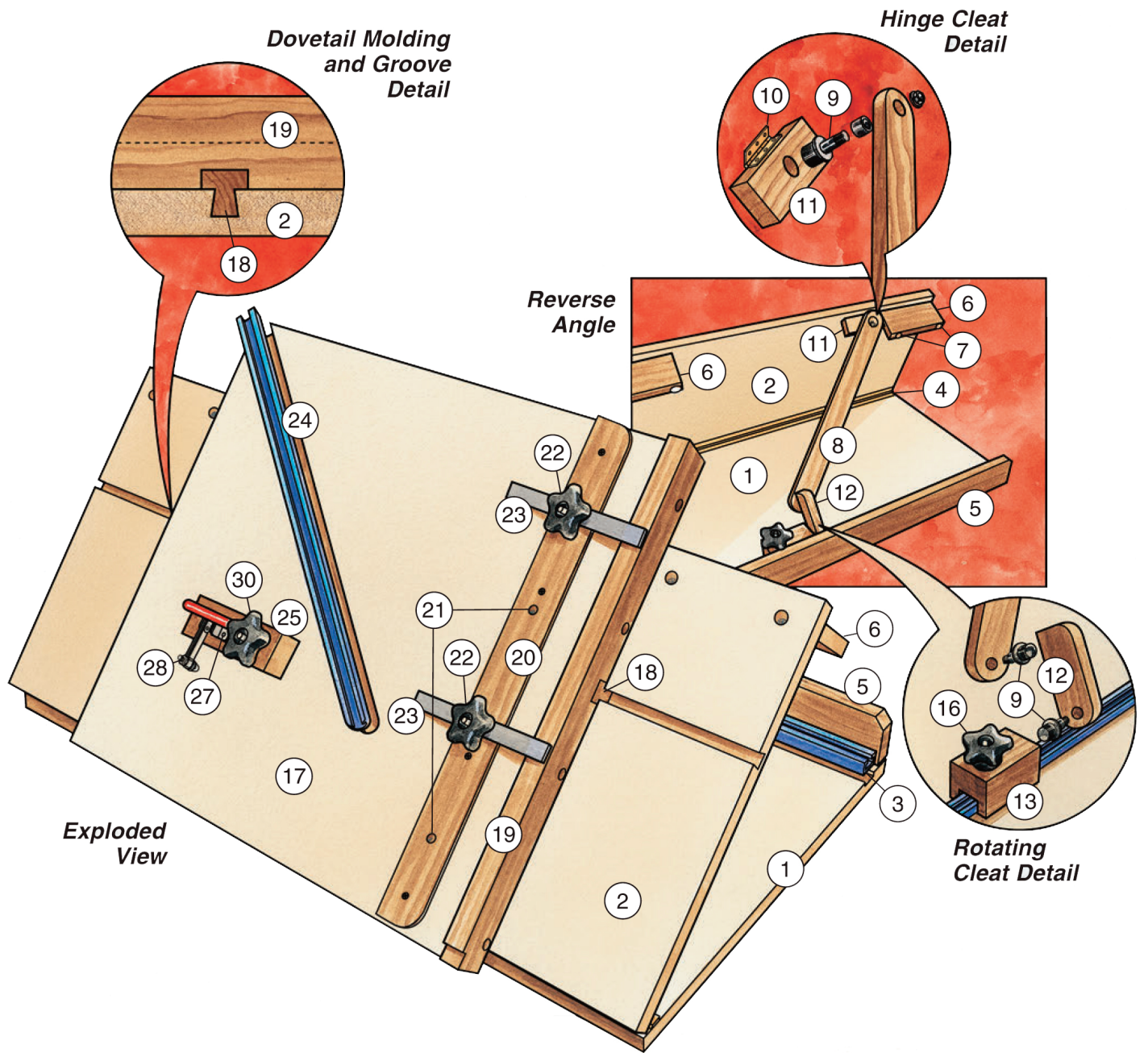
Grind or sand one end of the track to match the round end of the groove, then cut the other end square. Secure the track in the groove with short screws and epoxy, then belt sand a slight chamfer on the sled where the track emerges. This removes any potential sharp edges.

Cut the hold-down block (piece 25) to size, then drill a hole for a T-bolt (piece 26) at the location shown in the *Drawings*. Drill and counterbore four small holes for bolts (pieces 27), which hold the T-handle clamp (piece 28) in place. Secure them with locking nuts (pieces 29) and thread on the knob (piece 30).



Finally, apply a liberal coat of clear shoe polish to the bottom of the sled, and buff it to a shine. I've used this solution on my machine beds for the past two decades and they're all very slick and absolutely rust-free.





# Materials List

Part	Size	Amount Required
1. Base	3/4" x 18" x 30"	1
2. Plate	3/4" x 14" x 30"	1
3. Base T-track	1/2" x 3/4" x 30"	1
4. Continuous Hinge	1-1/2" x 30"	1
5. Fence Cleat	3/4" x 2" x 30"	1
6. Feet	3/4" x 2-5/8" x 6"	2
7. Nylon Glides	7/8" Dia.	4
8. Arm	3/4" x 1-3/4" x 17-3/4"	1
9. Arm Hinges	Pivot Hinges	3
10. Butt Hinge	2" x 1-3/8" Brass	1
11. Hinge Cleat	3/4" x 1-1/2" x 3-3/4"	1
12. Rotating	3/4" x 1-1/2" x 3-5/8"	1
13. Arm Base	1-1/2" x 1-3/4" x 4"	1
14. Arm Base T-bolt	5/16" - 8 x 2-1/2"	1
15. Washer	3/8 I.D.	1
16. Arm Base Knob	5/16" - 18	1
17. Sled	3/4" x 17-3/4" x 18-1/2"	1
18. Dovetail Molding	3/4" x 3/4" x 19-1/4"	1
19. Handle	3/4" x 1-1/2" x 17-3/4"	1
20. Sled Fence	3/16" x 1-1/2" x 17-3/4"	1
21. Threaded Inserts	5/16" - 18 Brass	4
22. Hold-down Knobs	5/16" - 18	2
23. Hold-downs	1/8" x 3/4" x 5"	2
24. Diagonal T-track	1/2" x 3/4" x 17-1/4"	1
25. Sliding Block	3/4" x 1-5/8" x 4-1/4"	1
26. Sliding Block T-bolt	5/16" - 18 x 2-1/2"	1
27. Sliding Block Bolts	3/16" x 3/4"	4
28. T-handle Clamp	350-lb. Capacity	1
29. Hold-down Nuts	3/16" Locking	4
30. Sliding Block Knob	5/16" - 18	1