

Do It Yourself

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European Dish Rack -- Rails, Stiles and Joinery

From "[Wood Works](#)"

episode WWK-410 -- [More Projects »](#)

In this episode of *DIY Wood Works*, host David Marks builds a European dish-rack that features a decorative fretwork pattern on the oak side-panels.

This hanging European dish rack is crafted from quarter-sawn white oak. The project presents an opportunity to learn how to design and cut open fretwork. On the side panels, a natural leaf design is cut out with narrow slots -- or frets -- connecting them. The side panels rest in frames that are attached to the angled side rails. Twin rows of spindles are cut and fit into mortises and help to keep saucers and plates separate. The rack is attached to the wall by means of a French cleat.

This project can be divided into three main phases: the spindles and support rail, the side panels featuring decorative fretwork, and the frame which holds the structure together. The piece features frame-and-panel construction and mortise and integral-tenon joinery.

In quarter-sawn boards, the growth-rings are approximately perpendicular to the wide faces, resulting in a beautiful medullary ray-fleck grain pattern, a hallmark of the American arts-and-crafts style.

Materials:

White oak stock

Table saw

Tenoning jig

Hollow-chisel mortiser; 1/2-inch mortising bit

Straight-edge

Carpenter's pencil

Safety glasses or goggles

Note: Cut sizes may vary. For exact measurements, please contact David Marks through his Web site -- information below under Resources.



The clean lines and elegant fretwork of this dish rack make this piece the perfect display backdrop for your best china.



The end panels are adorned with fretwork depicting an oak-tree -- a visual reference to the fine hardwood from which the piece is constructed.

Safety Alert: *Always* wear safety goggles or safety glasses when working with wood, power-tools, saws, drills, routers, etc.

Rails, Stiles and Joinery

Steps:

- Begin the project by building the basic framework. The ends of the frame are made using rail and stile construction.
- The stock for the stiles is cut from 8/4-stock that's milled 1-5/8 inches square and cut 16-1/4 inches long (**figure A**). These pieces form the four corners of the rack (**figure B**).
- Mortises are cut in the stiles using a drill-press and hollow-chisel mortiser. In this setup, a drill-bit is combined with a hollow chisel (**figure C**). As the drill-bit bores out the stock, the chisel pares the corners square.
- With the joinery laid out on the stiles, cut the mortises that will join the rails using the mortiser (**figure D**).
- Using a half-inch hollow-chisel mortising bit, cut each mortise four passes (**figure E**).
- Since there will be considerable weight on the joints, integral tenons are cut in the rails to maximize the strength of the frame. The ends of the tenon are angle-cut (**figure F**) so that they join inside the mortise at right angles.
- To cut the integral tenons, set the height of the ripping blade on the table saw to 1/8-inch and score the faces of the short rails. Use the same setting and repeat the process on the faces of each long rail.
- Next, raise the blade to 1/4-inch, and score the shoulders on both the short and long rails. (**figure G**).
- Use the tenoning jig on the table saw to cut away the cheeks on all four sides of the long and short rails (**figure H**) to expose the



Figure A



Figure B



Figure C



Figure D



Figure E

integral tenons. A cast-iron tenoning jig is a reliable tool for cutting tenons because it is both heavy and stable.

- To finish the tenons, a 45-degree angle is cut into the end of each. To ensure that the tenons are all cut to the same length, a stop-block clamped to the fence references against the top shoulder of each tenon (**figure I**).
- The top back-rail serves a dual purpose: it's part of the frame as well as the main support for hanging the rack on the wall. Starting with stock that's extra wide, a **French cleat** is made. This technique is designed to hold a lot of weight by spreading the load over the length of the rack. The wide piece is ripped to size, making a 45-degree cut. The fall-off from the cut becomes the cleat that attaches to the wall. The two angle-cut pieces come together at the back of the structure (**figure J**) to support the rack.
- To make the angle cut for the French cleat, adjust the blade of the table saw to 45 degrees. Use anti-kickback rollers to hold the stock firmly against the fence as the ripping cut is made (**figure K**).
- The tenons on the ends of the back support-rails are offset so that the rail sits even with the two back posts (**figure L**), and flush against the wall. This is different from the other rails which are positioned to create a slight reveal.
- To make the tenon on the support rail, score the shoulders on all four sides. Each side is a different dimension. Score 1/4-inch on the top, 3/16-inch on the front, 1 inch on the bottom and 1/8-inch on the back (**figure M**).
- Use the tenoning jig to cut away the cheeks, resetting for each cut. Finish the tenon by making a 45-degree cut on each end. Again, the stop-block clamped to the fence helps ensure that the tenons are cut to the same length.
- With the tenons all cut, conduct a dry-fit of the frame. At this point, you can decide on the position of the support rail that will hold the plates. The positioning of the support rail may depend on the size of your plates. As seen on our prototype (**figure N**), angled slots are cut in the top of the support rail to hold the dishes, while an integral stub-tenon is cut on each end to join the support piece to



Figure F



Figure G



Figure H



Figure I



Figure J

the bottom side-rails.

- Use the hollow-chisel mortiser and 1/2-inch bit to cut mortises in the bottom side-rails to match the tenons of the support rail. Make each cut in three passes to produce a mortise that is 1-1/2 inches long (**figure O**).
- Use the table-saw to cut stub-tenons on the ends of the support rail by notching away the side shoulder-stock. Once the stock is removed the stock from both sides, raise the blade 1/4-inch and notch away the top and bottom shoulders until the stub tenon is exposed (**figure P**).
- At this point, you can conduct a second dry-fit to take measurements for the dimensions of the spindles and side-panels.

In the segment that follows, the front face of the dish rack is assembled.

[Click here](#) to order your tools and materials for this project from **Woodcraft!**

RESOURCES:

Fine Woodworking

A magazine devoted to high-quality craftsmanship in woodworking.

The Taunton Press Inc

Newtown, CT 06470

Phone: 203-426-8171

Fax: 203-426-3434

Email: service@taunton.com

The Small Wood Shop (The Best of Fine Woodworking)

Model: 1561580619

Author: Helen Albert (Editor)

Woodworking Techniques: Best Methods for Building Furniture from Fine Woodworking

Model: 1561583456

Author: Fine Woodworking Magazine

The Taunton Press Inc

Newtown, CT 06470

Phone: 203-426-8171



Figure K



Figure L

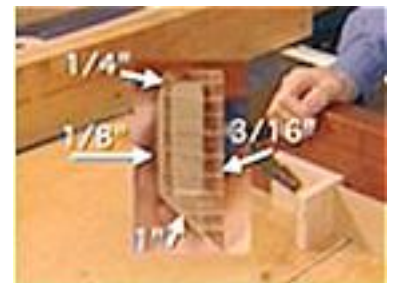


Figure M



Figure N



Figure O

Fax: 203-426-3434

Email: service@taunton.com

Mastering Woodworking Machines (Fine Woodworking Book)

Model: 0942391985

Author: Mark Duginske



Figure P

David Marks Website

David Marks, DIY's *Wood Works* host, is a master woodworker. For more information on cut sizes and project details, please contact him via his Website at www.djmarks.com

• ALSO IN THIS EPISODE:

[European Dish Rack -- Rails, Stiles and Joinery](#)

[European Dish Rack -- Front Assembly](#)

[European Dish Rack -- Side Panels and Fretwork](#)

[European Dish Rack -- Assembly and Finishing Touches](#)

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