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American Association of Woodturners

Oval Traditions

By Alan Lacer

A visit to the oldest continuously operating mill in North America

We are so obsessed with turning round objects with our lathes that we forget there are long traditions of doing shapes other than circles. For instance, there is the process of off-center turning between the centers to produce such objects as simulated cabriole legs or as you might see in Mark Sfirri's turnings.

But with face work, there has been a parallel tradition of varying the central axis to produce ovals or ellipses. Turners could accomplish this by remounting a piece on different axes, although some find this method unrewarding because it requires considerable handwork to blend the different turning operations.

Another option is incorporating a chucking system that performs this operation during each revolution of the lathe. Such chucks have been mentioned in literature even in the early 1700s. An amazing shop located just outside of Boston still employs that method.

The Old Schwamb Mill in Arlington, in continuous operation since 1864, has specialized in oval frames for 140 years. Although the mill doesn't produce the volume it once did during its heyday of the late 19th and early 20th centuries, it still turns out the same high-quality oval picture and mirror frames that brought it considerable notoriety decades ago.

Water-powered origins

Besides producing about 50 frames annually, Old Schwamb is a time capsule of a bygone era. First, the shop's power system is intriguing. Originally power came from a 19-foot-diameter water wheel, then a steam engine, then a water turbine that assisted the steam power, and finally a pair of centrally located electric motors installed in 1954. What all of these power systems had in common was driving a series of line shafts and flat leather belting that powers virtually every machine in this sizeable wood shop.

This is a shop that performs virtually all aspects of frame making. This involves cutting lumber to size, joining and gluing four pieces of wood as the basis for turning, the actual turning, and in many cases, final finishing. A massive bandsaw, sliding-top tablesaw with ingenius jigs, and and specialty lathes still work today to turn out the frames.

Whirr of activity

The four lathes of different sizes are of special interest. These are essentially faceplate lathes supported by heavy timbers, sizeable spindle shafts, and extra bracing. As you can image, there will always be an issue of "out of balance" when doing oval work—hence the need for such features.

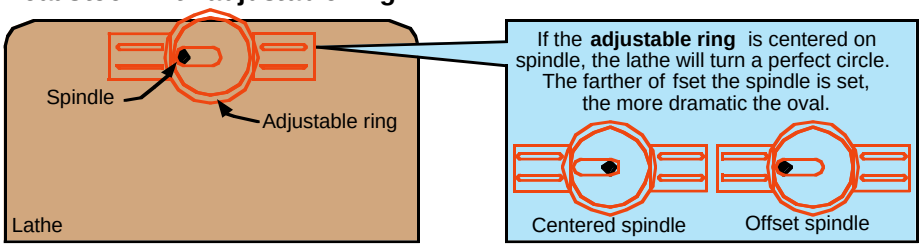
Continued

The "secret" to oval turning lies in this moving chuck, above left. Three lathes, shown above right, are on the main floor.

The mill's turner, David Graf, shapes the outside of a small oval frame. All steps—from raw stock through finger-jointing and turning—are performed at the mill. In the mill's historically accurate setting, eye protection isn't worn.

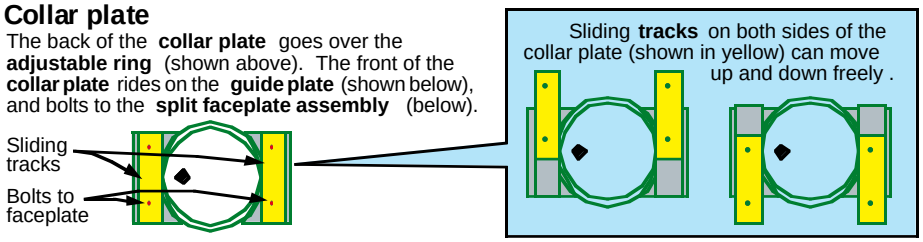
SCHWAMB MILL'S ECCENTRIC LATHE (Looking at end of spindle.)

Headstock with adjustable ring



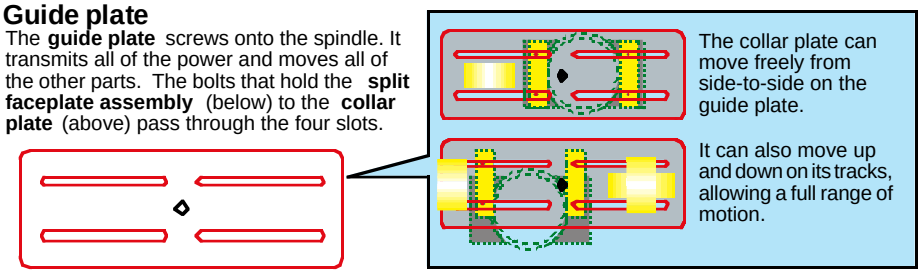
Collar plate

The back of the **collar plate** goes over the **adjustable ring** (shown above). The front of the **collar plate** rides on the **guide plate** (shown below), and bolts to the **split faceplate assembly** (below).



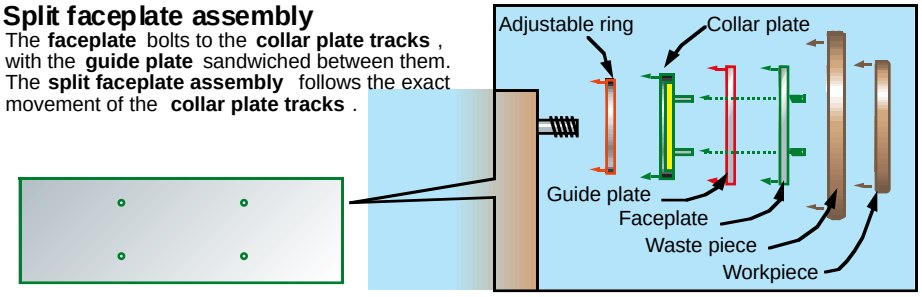
Guide plate

The **guide plate** screws onto the spindle. It transmits all of the power and moves all of the other parts. The bolts that hold the **split faceplate assembly** (below) to the **collar plate** (above) pass through the four slots.



Split faceplate assembly

The **faceplate** bolts to the **collar plate tracks** , with the **guide plate** sandwiched between them. The **split faceplate assembly** follows the exact movement of the **collar plate tracks** .



But it's some ingenious German-made chucks that really make the oval turnings possible. Constructed of several sliding plates, these chucks allow the turner to make circular objects or ellipses. The amazing phenomena that occurs is that these chucks allow every part of the ellipse to be turned on each revolution of the lathe—something not possible by simply remounting a piece to a different axis. One tool rest and one position does it all.

As you watch the turning proceed at speeds well under 1,000 rpm, you are amazed by the "normalcy" of the turning that is occurring on the left side (where turners normally cut in any face-grain operation) where your turning tool would be located. But to the right of the lathe's axis, there's a tremendous blur of activity and the sound of the chuck's sliding metal parts.

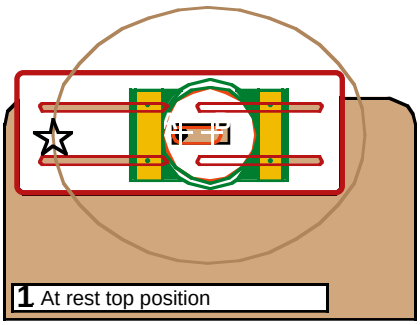
Let's set the parts into motion

Orange=Adjustable ring
Green=Collar plate
Gold=Collar plate tracks
☆=Tooling position
Red=Guide plate
Tan=Lathe Headstock
◆=Spindle

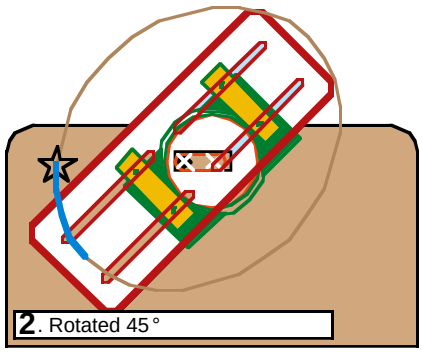
There are two axis points to know about.
A. The spindle (solid black) is connected to the guide plate, and spins it on Axis A.
B. The other axis (B) is at the center of the adjustable ring (orange). The collar plate (green) also follows this axis.

The collar plate tracks (gold) are the most important players in this spinning game. Connected on one side to axis point A, and the other to axis point B, they slide to form a compromise between the two rotating forces–an oval.

Note: The workpiece follows the arc of the collar plate tracks. It is shown as a tan line, with a blue line representing the path of the arc.



Note that the collar plate tracks (gold) are centered horizontally on the collar plate (green). Also note their position on the slots in the guide plate (red).



As the spindle rotates, the collar plate tracks slide to adjust for the dif fering axis. The result moves the workpiece closer to the tool rest center.

Most of the tools are unique to this operation also. Many of the tools are shop made, including the special rabbeting tool to cut the groove for the picture or mirror.

Most of the tools are scrapers. What struck me most in watching David Graf, the shop's turner, was that this turning is very much still a hand process with hand tools that require considerable skill and steadiness to produce a museum-quality frame.

History that lives

If you have even a small interest in history or different turning methods, the Schwamb Mill just northwest of Boston is a "must see" for individuals or as a woodturning club outing. Guided tours last about 45 minutes. You can find information on the mill by calling 781-643-0554 or at www.oldschwambmill.org.

Note: We have it on good authority that a major chuck manufacturer has a modern version of the oval chuck under development.

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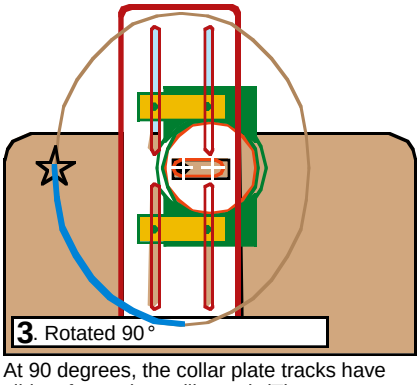
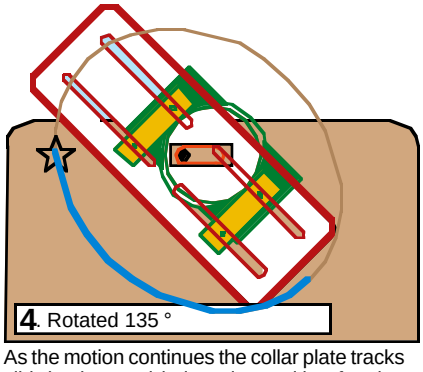
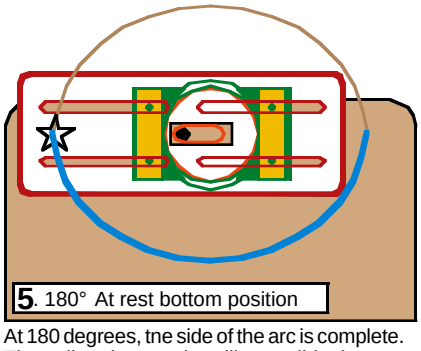
The frames produced on this lathe require a chuck almost 6½ feet across—and it moves several directions while turning. The middle of three posts is 12½" x 7".



At 90 degrees, the collar plate tracks have slid as far as they will travel. (The same distance as between the two axis points.) This will be the narrowest point of the arc.



As the motion continues the collar plate tracks slide back toward their resting position, forming a gradual arc.



At 180 degrees, tne side of the arc is complete. The collar plate tracks will now slide the opposite direction to continue forming the arc.