Segmented Box with Insertable Lid

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This project began with my desire to combine a new interest of sandblasting glass with wood. Since my main interest in woodturning is in segmented work, I realized that I could combine a segmented ring with a piece of glass and make a lid for a box. A few more rings would make the sides and a solid piece of wood would work best as the bottom. Variations could include: 1) designs in the rings that make up the sides of the box, 2) differing numbers of rings for the sides to make the box taller or shorter, and 3) different materials for the insert in the ring that makes up the lid.

Choice of Woods:

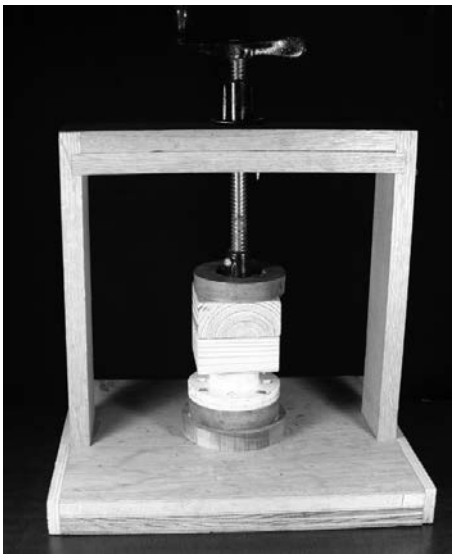
When choosing woods for the box, I keep a few things in mind. I would like to have contrasting woods on the bottom and sides. The top will look better if it compliments or better yet matches the wood on the bottom. The bottom wood should be a stable wood that will not cup over time and pull away from the sides. If using a wood like oak that has a tendency to cup, you might glue two or more pieces together to make the bottom, alternating the grain pattern. The wood used for the top piece and sides will be in the form of a segmented ring and so wood movement should be a minimum. I like to use a darker wood on the bottom and the same wood on the top. The sides are usually made of contrasting white maple. The wood needs to be dried to match the humidity of its final resting place. All wood can be to 1 inch thick.

Preparation of the Faceplate:

The body of the box is constructed and turned on a faceplate. I begin by screwing a 1 inch thick piece of wood to the faceplate and turn it to match the size of the faceplate. A 1 inch thick piece of waste wood is then glued with Titebond 1 wood glue to the screw block and then turned to match the size of the screw block. The screw block does not have any wood removed from it and so is never replaced.

Glue two pieces together

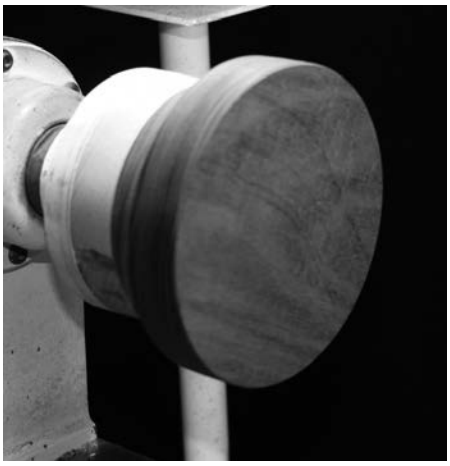
Place glue on the top piece of wood(waste block) of the faceplate assembly. Spread the glue around evenly. Take the piece of wood to use for the bottom and turn it upside down. Center the face plate on the wood and clamp until dry. I use a homemade screw clamp press that



was featured in Wood magazine. Also I have used the drill press by raising the table on the press. A third option would be to use your lathe as a press. Use a piece of waste wood against the tail stock. After the glue has dried for several hours, return the piece to the lathe and turn the bottom piece round.

Turn to profile

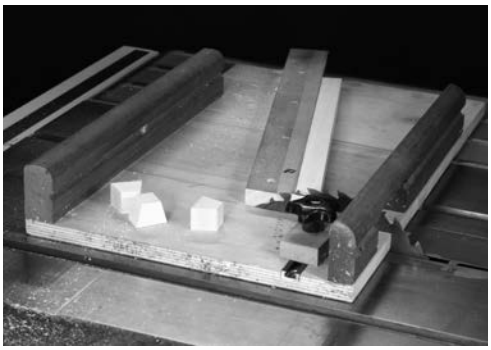
You can turn the profile on the bottom piece now or wait until later.



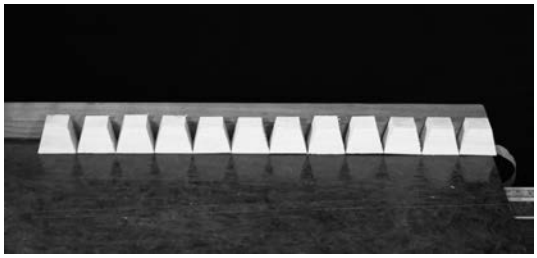
Now is the time to smooth the face of the bottom piece to receive the first segmented ring. I use a gouge or scraper and lightly smooth the surface. The center is turned slightly lower than the edges where the ring is set. A long flat piece of wood with 80-grit sandpaper is applied to the bottom piece to create a really flat area where the ring will sit. Always check for flatness with a straight edge of some kind. Lay the straight edge across both sides and look for gaps. Any gaps you see will probably show after the ring is attached. Repeat the steps above until there are no gaps.

Side Rings

We are ready for the first ring. The number of rings that you use depends on the height of the box. You could use between 1 and 5 rings. Generally I use two rings for the sides. A full discussion of how to construct is beyond this demo. The size of the ring should come out to near the edge of the bottom piece. You will turn most of this away. Briefly,



I cut the pieces on a table saw jig, glue them together with yellow glue

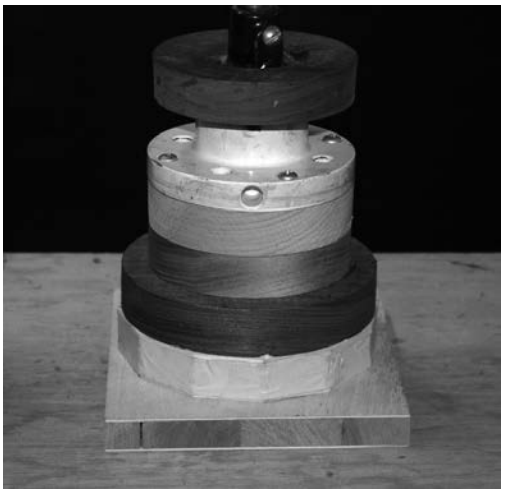


(Titebond I), and put a band clamp around them until dry. After several

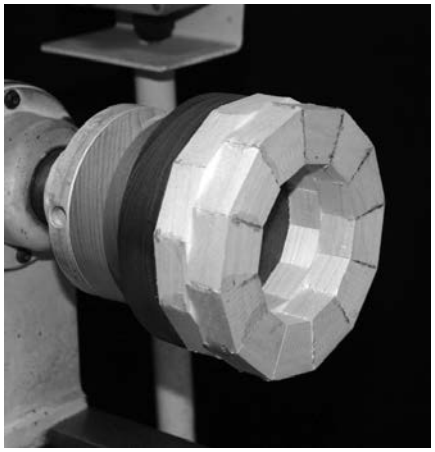
hours drying, I smooth the face on a 6 x 48 belt sander using a 50-grit belt. One could also use the lathe to create a smooth surface on the ring.

Attach and Finish Sides

Apply glue to the ring or bottom piece and spread the glue evenly. Center the first ring on the bottom piece and clamp for several hours. Create a second ring the size of the first and create one smooth surface as before. Place the piece on the



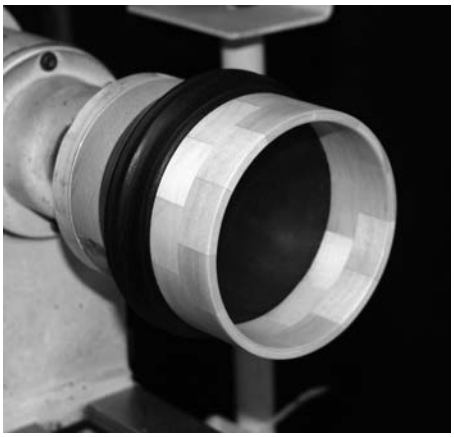
lathe and use a gouge or scraper to smooth the top of the first ring. I glue on all rings before turning them to final thickness. Use the sandpaper board to true the top of the first ring. Spread glue on the top surface of the first ring. Place the first ring down on the table, smooth face up. Set the bottom piece on the second ring so the joints of the first ring are in the center of the second ring. Use your eyes and fingers to make sure the spacing between the first ring and the outside of the



second ring are equal all the way around. This will also help to align the joints. Clamp the piece. After the glue is dry, return the piece to the lathe and reduce the wall thickness to between 3/16 and inch. I use a combination of scrapers and goug-

es. Sanding a finishing the bottom at this time is an option. Depending on the finish to be used, I will sand to around 220 grit.

The bottom is still attached to the faceplate. It is useful to be able to rotate the piece when applying fin-



ish. Because my lathe has variable speed that allows it to turn very slowly, I apply finish and let it turn slowly until it dries enough not to run. This really reduces any runs or blotchy finish.

Finish the Bottom

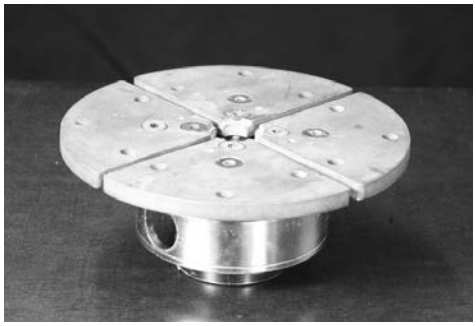
After the finish has dried (several days if you run out the finish), you

can separate the bottom piece from the waste block. You can either take the piece over to your bench or table and sand the bottom smooth or use a chuck or waste block to reverse chuck the piece. If you use a chuck be sure to use a lot of padding on the jaws to eliminate any marks in the wood or finish. Sand the bottom and apply finish.

Top Ring

We are now ready for the top of box. The top will consist of a segmented ring and a circular insert of some material to go in the center of the segmented ring. The segmented ring should be made from wood at least 1 inches wide. Make the ring diameter just a little larger than the diameter of the bottom piece. Make a segmented ring as before. To hold and turn the ring, you will need a chuck with some kind of large jaw arrangement. Although you could use dovetail jaws,

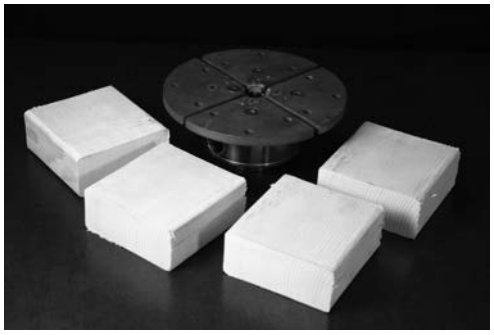
you would be limited in the sizes of boxes. If you have a set of Cole jaws or own a Oneway chuck you are in luck. You need a flat set of jaws to be able to attach wood to the face. Vicmarc does make a large set of dovetail jaws where the jaws can be



removed. Oneway has an inexpensive set of flat jaws that are great for attaching wooden pieces.

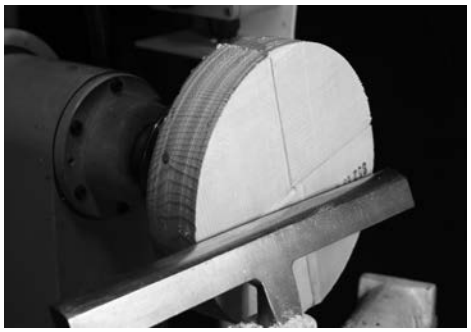
How to hold the ring

I use a Fir 2x4 to make the wooden jaws. The Pine 2 x 4 is a bit hard. A standard 2 x 4 is 3 inches across.

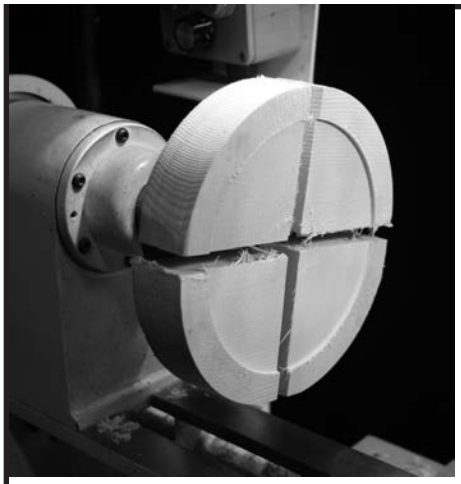


I cut four pieces 3 inches long. Close the flat jaws so that they touch. Place the four pieces of wood

to make a square with each piece aligned to the sides of the jaws. Attach the wood to jaws from the back

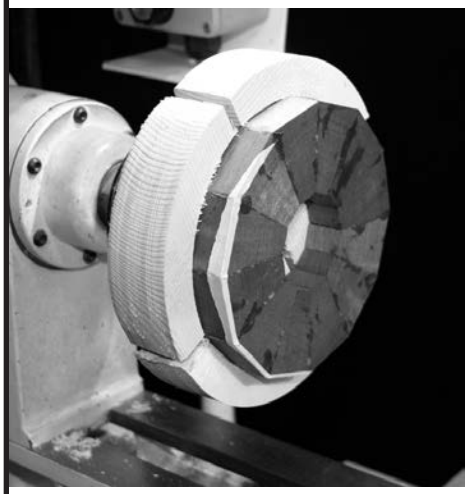


of the jaws. Place the chuck on the lathe and turn the square jaws round. You can now hollow out a place on the jaws to fit on the outside of the top ring of the box. Usually a place no deeper than inch is needed. The Fir is soft and not likely to make marks in the wood. The wood is cheap and easy to replace when worn down or cut away.

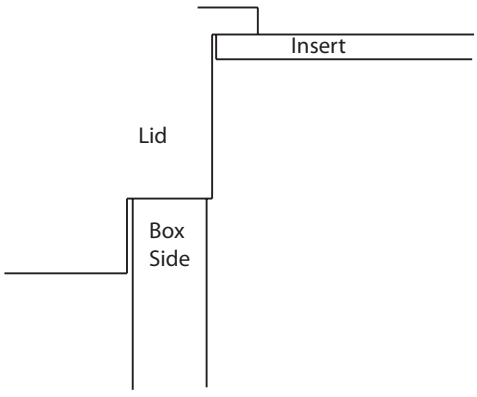


Making the Lid

Place the ring in the wooden jaws and turn one side of the ring flat. It

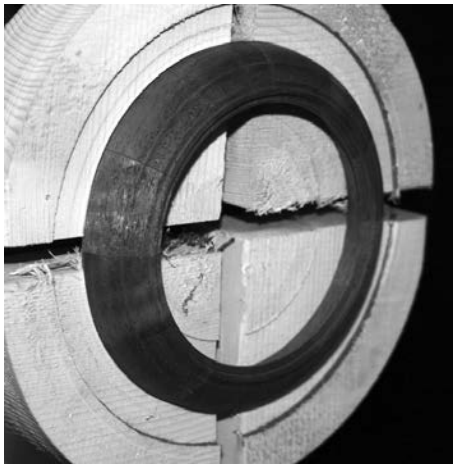


does not have to be perfectly flat at this point. Now turn the ring over and flatten the other side. With both sides parallel to each other, you can take the ring out and not worry about getting it back to the exact same spot. You will need to cut two insets. The larger inset will fit the lid to the box. The smaller diameter



inset is cut for the insert. I like to cut the inset to fit the lid about ¼

inch into the lid and large enough to be slightly loose on the body of the box. Leave at least inch width on the inset that will fit on the box. You can leave more if the insert is to be small. I like to cut the inset for the insert to within 3/16 inch of the top. I like to have the insert at the top of the lid. Leaving about a lip for the insert, turn away the rest of the wood on the inside of the lid. Shape the outer edge of the lid as much as



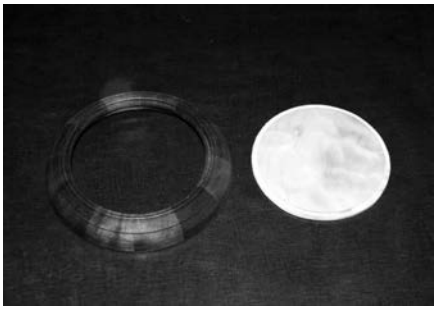
you can since part of the lid is setting in the wooden jaws. Sand the bottom of the lid at this time.

Turn a tendon in the wooden jaws to now fit the inside of the lid.

Fit the lid on the tendon and finish turning the outside of the lid. Sand the rest of the lid now.

Inserts

Inserts can be of varied materials: glass, wood, plastic



Add inserts, finials, segmented rings.