

Regulator Clock

Jim Tartaglia

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I'm at the stage in life where it has become apparent that if there is anything I want to do I had better get out and do it while I can. I have always wanted to build a regulator style clock with mechanical works salvaged from an old clock. I found some old works at the Brimfield fair but after having an antique shelf clock restored several years ago I realized that keeping them going required the services of a clockmaker from time to time and they (clockmakers) are getting hard to find. The pragmatic part of me took over and decided to go with electronic works.

The rule about buying all the hardware before starting the project applies doubly to clock making as the hands must be the correct length and style, the face has to fit the bezel and both must fit exactly in the face frame, the pendulum needs to be the right

size and hang in the correct position, then there are hinges and knob for the door frame and the fancy gold stencil. I solved all of these and other issues by using a plan from a magazine. I usually like drawing the plans myself but this was an exception. I used the plan so I would know exactly what to order and have all the correct dimensions. I generally don't trust dimensions in plans but on checking I learned the plan I had was right on.

The clock is built of solid red oak except for the face frame which is white oak veneer over an MDF core. I used oak for 2 reasons. First, this style of clock was frequently made of oak and second because I had a nice hunk of 12/4 red oak in my stash. As a corollary to the rule about doing stuff you always wanted to do is a rule about using all those little lumber nuggets you have been stashing all these years. I used white oak veneer for the face frame because I happened to have a piece that was just the right size and the colors of the two woods looked pretty close. More about this later.

Side note about Regulator clocks: In the early 20th century, up until the time that electric clocks took over, public buildings like schools, municipal buildings, offices, etc. all needed clocks that were not stylish but practical and accurate. To fill this need a style of clock that looks more or less like the one I built was developed and churned out by the millions by a number of clock companies. There is no specific definition to the term Regulator but it was attached to many clocks to promote the idea that they were precise, regular, the sort of clock you could set your watch by. There were many variations of style of Regulators made by many different companies. As antiques go they are not all that valuable today because there are so many of them still around and people find winding them weekly to be a chore. There are some people who keep them as decorative items and never wind them. I thought it would be better to have an electronic movement (complete with ticking sound) and actually use it than to have a mechanical movement and have it be right only twice a day.

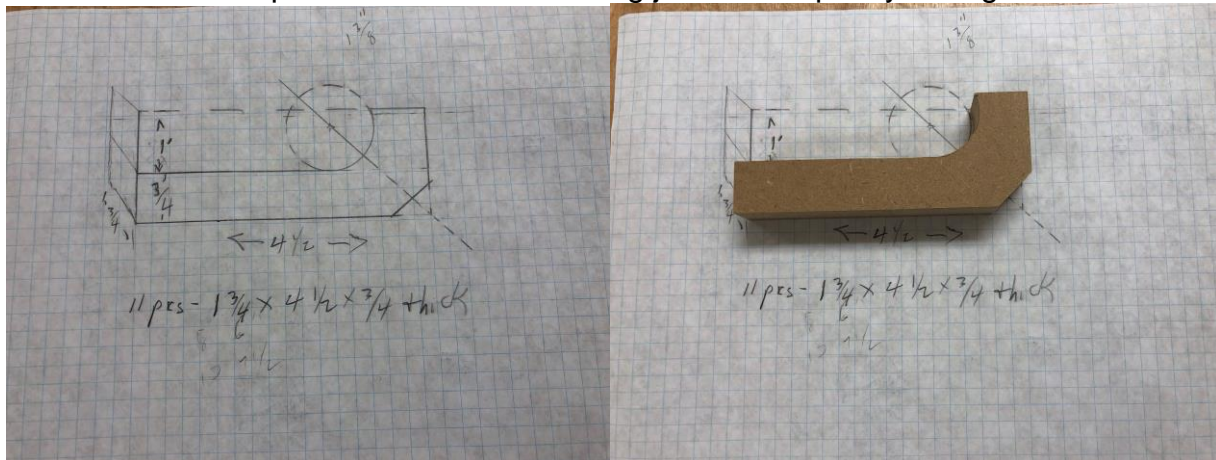
Getting back to building this one, I started by bringing the rough board (it was a cutout for a sink in a large counter) in from the barn and letting it set stickered in the shop for a couple of months in the winter when the air is dry. Next I ripped it in half to make it easier to handle and so I could check it inside with a moisture meter. The moisture meters with little pins are meant for 4/4 boards, anything thicker and you need to check them inside. Eight to ten percent is perfect for furniture. Air dried lumber will never get below ten to twelve percent if it is stored in an unheated area. Then I milled the stock I needed from it with 20% or so extra for the oopsies, stain testing, etc. The back is made from thin strips glued-up to give quarter sawn. Most of the rest of the parts are made from $\frac{3}{4}$ inch stock.



Making the case parts was pretty straight forward. The Incra miter gauge is quite accurate and came in handy. I glued everything with hide glue as it never leaves little spots that don't show up until you finish the thing. The face frame was a project in itself. I wanted all the grain to point towards the center. I had seen this on several antique examples and liked the look but how to do it? It had to be veneered as solid pieces would be all short grain and the outside edge would be all end grain. Luckily, each of the eight pieces needed was not very big. I decided to make a form from pieces of MDF glued up and coated with many coats of polyurethane so glue would not stick to it. It is surprising how much finish the MDF sucked up. The pieces of veneer were soaked in hot water for maybe 10 minutes then clamped in the form for a few hours. Then a piece of shaped MDF was coated with hide glue and clamped to the, now curved, piece of veneer in the form. The resulting pieces worked but some had areas where the glue did not stick which could be detected by tapping the surface for voids. The Jim Russell trick of taking a small square of Melamine, heating it with an

iron, then clamping over the unglued spot, worked fine. I needed eight pieces but made eleven and was glad I did.

Because I had taken the class offered by Jonathan Levy on turning segmented bowls I knew the trick to gluing up octagons. First glue four pairs, next glue two halves, finally sand the ends of the two halves on the bed of a belt sander until they fit perfectly. Using hot hide glue on each pair of pieces made it easy to make a rub joint and just hold it for a few seconds, no clamp needed except for the final glue up on which a band clamp was used. The resulting joints were plenty strong.



With the case, the door frame, and the face frame assembled things were moving along pretty smoothly but the wood color of the red oak case and the white oak face frame were too different. It seemed easy enough to stain the face frame to match the case. Naturally I first tried staining on a piece of scrap to avoid disaster and it came out OK but since Murphy's Law frequently applies, disaster struck anyway. The stain job on the face frame was horrible! Streaky, blotchy, the wrong color, you name it. I tried several ways of removing the stain but nothing worked. The idea of remaking the face frame was a looming nightmare. Then I remembered that I had used thinned hide glue as a filler on the face frame because the oak grain is so open. Hide glue is reversible! Could I possibly use hot water to remove the hide glue, which was under the stain, and take the stain away with it? But even if it could, the veneer was held to the substrate with hide glue as well. Too much hot water could unstick the veneer and result in a real mess. Since the alternative was throwing away the face frame and making another one why not give it a try? It worked! Holding a rag soaked in hot water on a section of the frame long enough to soften the glue then quickly wiping with a paper towel removed the hide glue filler and took the offending stain with it without ungluing the veneer.

To get the case and face frame to be the same color required some kind of stain and the Behlens non-grain raising stuff I was using was certainly not the right one. So I tried an old trick Loren Maneck, one of my early woodworking teachers, taught me and used artist color, essentially oil paint, in Van Dyke Brown, one of several colors Loren said could be mixed to reproduce any wood color. First coat the piece with a layer of Linseed oil then rub in the color. It can be blended and played with as long as you like as it takes days to dry and while its wet can be easily removed if you don't like it. You can see the results in the finished clock. The finish is shellac.



Cutting glass is fairly easy as long as you remember four things: 1. Get a good quality glass cutter, 2. Lubricate the little wheel with kerosene (diesel fuel or home heating oil work too), 3. You get JUST ONE SHOT at scoring the glass (you can't go over it a

second time) so tape down the straight edge so it doesn't move on you, 4. After scoring secure the keeper piece to the benchtop and snap off the waste just like you do when cutting a piece of sheetrock only with a glove on just in case. Following these rules I was able to cut the glass for the door OK except that it was slightly, maybe a sixteenth, oversize on one edge. While it's easy to cut a large piece of glass it is really hard to cut a very small piece. What to do? I reasoned that diamond is harder than glass and my sharpening stones are diamond, could I just "sand" it down on a 300 grit diamond stone with a little lubricant? Yup, it works great.



Final details can make a big difference in a piece. I was surprised to find that not only were gold door stencils available, they are available in a large variety of shapes and styles. A lot of people must build these clocks. They attach to the glass by rubbing them with a burnisher. The door catch was made by taking apart a standard magnetic door catch, taking one of the two little magnets found inside and epoxying it into the door. It was just strong enough. Once the whole clock was assembled I realized that the metal parts were different colors and most were shiny. As I was going for an antique look I used crafters stuff called Rub 'n Buff. It comes in little tubes, lots of colors, and, as the name implies, you rub it in and buff it up. It gave all of the hardware the same antique look.

The finished clock now hangs in my shop and I think it is there to stay.