Restoration of a Hotchkiss and Fields Woodworks Clock

by Tom Morris (MI)

I found this clock in a used furniture and antiques shop in Monroe, MI, in 2013. Although I knew little about this clock, it looked like a good restoration project. It had most of its parts, the label was in decent shape, and it had a woodworks movement—my first. I eventually learned it would be the oldest clock in my collection.

History

Elisha Hotchkiss and Edward Fields, his son-in-law, made this half-column and splat clock with a 30-hour Terry-type weight-driven woodworks movement, striking the hour on an iron bell. Hotchkiss, the clockmaker in this partnership, made clocks under his own name from 1830 to 1838 in Burlington, CT. The partnership with Fields was from 1838 to 1845. Philemon Canfield in Hartford, CT, printed the label, and it is believed that Canfield made labels for Hotchkiss and Fields from about 1839 to 1841, which effectively dates this clock. Hotchkiss made some of his own wooden movements, and based on Snowden Taylor's woodworks research, the movement fits the characteristics of an 8.137, which was likely made by Hotchkiss.

Condition as Found

This clock was in rough shape when I found it (Figure 1). Veneer on the mahogany case was missing on the left side, the base, and the top, and the finish was nearly gone. The base was cracked (Figure 2) and needed repair. The door was missing veneer and had some poor veneer repairs (Figure 3). The half columns were painted black, and there was no evidence of any prior decoration. The splat had been replaced, but it was solid mahogany and well made. The upper glass on the door appeared original and was still puttied in place. A mirror in the lower opening of the door was held in place with wood strips and was likely an old replacement. The door was mounted with modern butt hinges that had been mortised into the door and frame. The original plate and pin-type hinges were missing. The dial had significant paint loss and some attempted previous touch-ups. The

Figure 1. Hotchkiss and Fields woodworks clock as found.

Figure 2. The cracked base.

Figure 3. Poorly done veneer repair on the door.

Figure 4. Veneer around the door lock repaired.

hands, suspension spring, pendulum bob, iron bell, door lock, and key appeared original. The movement was intact, but several teeth were replaced on the strike great wheel, and one tooth was replaced on the time 3rd wheel. Several brass bushings had been installed, and all pivots had been lubricated with some sort of green grease that long ago had become as hard as a rock. There were no weights, and the weight pulleys were so worn that it was unlikely the weight cords would have stayed in the grooves. As with many of these clocks, the pulley dust covers were missing. The label was very dirty with some

Figure 5. The case after repair and refinishing.

loss where the weights had worn it away and some flaking and loose areas. It was legible in the center, including the printer's name.

Restoration Project

As I evaluated this clock, I thought it would be a candidate for refinishing because major veneer repairs were needed and there was little original finish to preserve. Because of the previous poor repairs, the movement needed major work. The label required conservation and the dial needed restoration or replacement. The columns and splat presented a perfect blank "canvas" for stenciling, which I had never attempted before. The restoration began in early 2015.

Case Restoration

The case was disassembled to repair the veneer; the door glass and mirror were also removed to prevent breakage. A large gouge on the left side of the case

Figure 6. The clock dial as found.

Figure 7. The replacement dial.

had damaged the veneer, and all of the veneer was missing from the base. The base was cracked along the front edge, and the door had some damaged veneer and some mismatched grain repairs. Other parts of the case had small areas of veneer loss. After repairing the base and other damaged areas, I replaced all of the missing veneer (Figure 4) with either veneer harvested from other clocks during their restoration or old stock veneer that I had accumulated from several woodworking friends.

The case parts were then stripped of all remaining finish, stained dark mahogany, and top coated with Waterlox Finish and Sealer, a tung oil varnish. For a proper period restoration, shellac should be used as the final coat, but I have had little success with shellac, so I chose to use the tung oil varnish. It provided a gloss finish similar to shellac without all of the rubbing out or French polishing. The case was then reassembled and set aside while other restorations were completed (Figure 5). I thought about replacing the modern door hinges with period hinges, but the mortising would still be obvious and visible, so I elected to keep the modern hinges as the best solution.

Dial

The wooden dial had considerable paint loss and evidence of prior touch-up attempts (Figure 6). I had taken an NAWCC dial painting class a couple of years ago, so I had a little experience with redoing metal dials; the procedure basically involves stripping them and starting over. This typical wooden dial was decorated with gold accents and other designs that would be lost with that type of restoration. My reading on the subject warned against trying to do this myself. The options were to use it as is, send it out for professional restoration, or find a replacement. I chose the latter and found a period wooden dial with the correct winding hole dimensions on eBay for less than $100. It wasn't quite as ornate as the original dial, but it was in very good condition (Figure 7). I will keep the original dial in case I want to have it restored at a later date.

Label

The label (Figure 8) was dirty and had some staining and loose areas; small pieces that had flaked off were found in the bottom of the clock. The weights had rubbed off parts of the label on both sides, which was typical. My first step was to glue down loose areas and glue the pieces back where they came

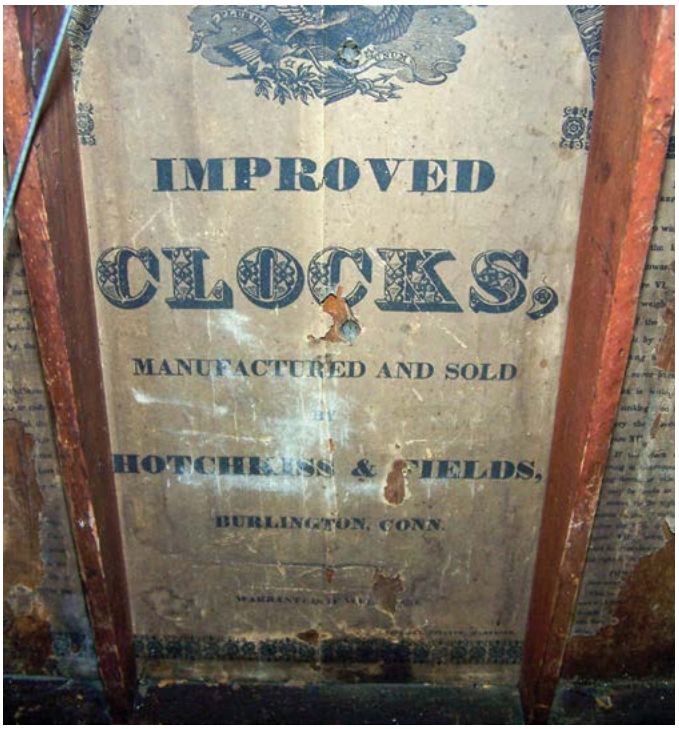

Figure 8. The label as found.

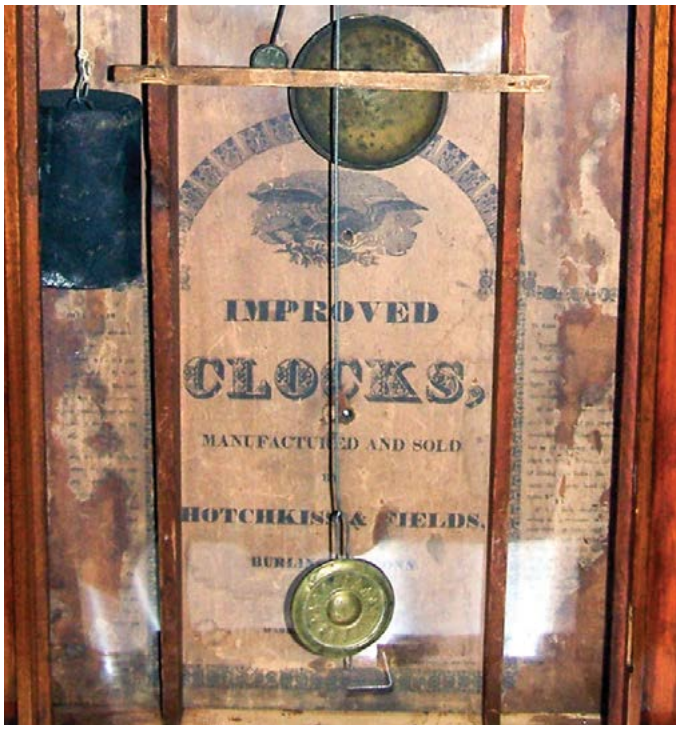

Figure 9. The label after conservation.

from. I used acid-free glue that dried clear. Once the label was secure again, I used a soft, dry paintbrush to brush off the loose dirt and then a draftsman's cleaning pad (basically a cloth bag with eraser pieces inside) to gently go over the surface and remove dirt that was more persistent. This obviously won't make it look like new again, but it did brighten it up. As a general rule, I neutralize the acid in all of my clock labels after cleaning. The label in a clock of this era was made of rag paper and therefore not acidic; however, it was attached to an acidic wood panel, so these labels often test acidic. Neutralizing the acid will slow down the aging process.

The most realistic neutralizing and stabilizing method to use is Make It Acid Free, typically available at most arts supply stores. I like Archival Mist because it doesn't leave a white residue on the label. Once neutralized, I covered the label with very thin (0.003 inches thick), clear Duralar, which is also acid free. This will protect the label from further weight abrasion, dust, and dirt (Figure 9).

Movement Repair

Inspection of the movement (Figure 10) revealed that it was intact but needed repairs, including replacing teeth on the strike great wheel and one tooth on the time 3rd wheel. My first step was to obtain weights and see if it would run. As soon as tension was applied to the time train, I heard a small pop and the weight dropped slightly. A quick look showed that a tooth had broken on the time 2nd wheel pinion (Figure 11). I removed that wheel and made the repairs. I cut a small trench where the tooth had been, both under and at the back to give more surface area for gluing the new tooth (Figure 12). A new tooth was roughed out of a scrap of cherrywood and epoxied in place (Figure 13). The tooth was shaped by using files and sandpaper to match the others, and after applying a bit of dark stain, the repair could hardly be seen (Figure 14). But would it work and would the time train run reasonably well?

Unfortunately, the strike train locked up each time the replaced teeth on the great wheel attempted to mesh with the driven gear. Six teeth had been replaced on this gear, but their spacing and profile were poorly done. After I disassembled it again, I made a template of the gear by using the part of the gear that still had original teeth to trace good teeth in the broken area (Figure 15) and then broke out the rest of the bad teeth (Figure 16). Using this template and the broken part of the gear, I traced the outline of the piece being replaced onto a piece of cherrywood (Figure 17) that was the same thickness as the wheel. This was cut out with a coping saw; the inside shape being mated to the gear was filed and sanded until

Figure 10. The movement as found.

Figure 11. Time 2nd wheel pinion with missing tooth.

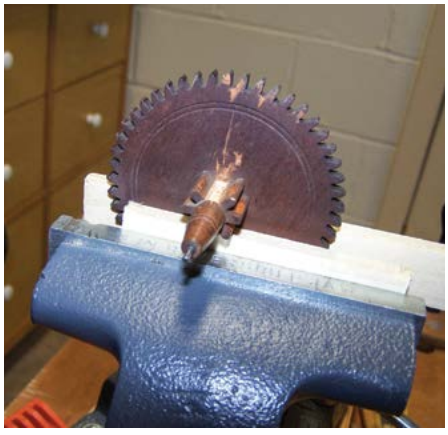

Figure 12. Pinion prepared for the new tooth.

Figure 13. New tooth being epoxied in place.

Figure 14. Time 2nd wheel repair complete.

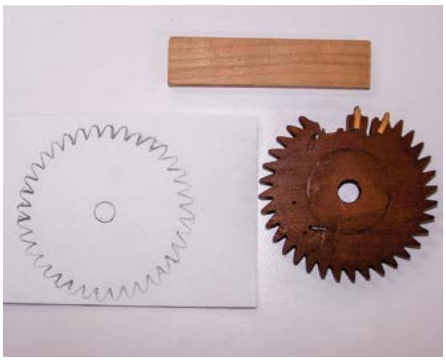

Figure 15. Template, cherrywood stock, and broken strike great wheel.

Figure 16. Strike great wheel prepared for teeth replacement.

Figure 17. Repair blank with outline of replacement piece.

Figure 18. Repair blank shaped to fit the gear.

Figure 19. Repair blank ready for epoxy. Teeth left unfinished.

Figure 20. Repair piece epoxied in place.

it fit perfectly (Figures 18 and 19), and the tooth profile was left roughed in for now. This piece was then epoxied (Figure 20) to the wheel carefully to avoid getting epoxy on the nearby click. Once the epoxy cured, the tooth profile was hand filed (Figure 21). To complete the repair, the epoxy residue was removed by sanding and stain was applied (Figure 22). The strike train now operated properly without binding.

The remaining movement repairs involved cleaning the hardened grease, and I saw bushings that seemed to be short pieces of brass tubing pressed into several pivot openings. I chose to leave them in place, but I burnished them smoother for the pivots and made sure they were aligned well between the plates. Two were not well aligned and caused their wheels to catch as they turned. Additional work using drill bits and burnishing tools seemed to resolve binding without adding more clearance. A conventional brass bushing was installed in the escape wheel bridge that had significant wear. While apart, I replaced the weight cords and then examined the pulleys that were worn to the point of almost not having grooves for the cords anymore.

I turned new starkly white maple pulleys (Figure 23) into a dark, almost black color that matched the other wood (Figure 24) by soaking them in a tea solution (a tea bag and water) for a few days. Pulleys were air-dried and then soaked in iron acetate solution that was basically the liquid left from dissolving steel wool in vinegar. The movement ran and struck and was set aside while I began work on the splat and columns.

Stenciling

Because the clock was plain, I wanted to decorate it, and I thought stenciling would be an appropriate decoration. My objectives were to use an authentic stencil, to use period techniques, to avoid that brand-new look, and to do it myself.

My research indicated that William B. Fenn was the go-to guy for mid-nineteenth-century stenciling patterns. Copies of his stencils are available in the referenced books. I selected a flower basket design that fit the shape of the splat and a grapevine pattern

for the columns (Figure 25). The stencil copies were actual size, so I scanned and printed them on paper and then spent several hours cutting them out with an X-Acto knife. I made paper punches out of brass tubing with the end sharpened. A light tap of a hammer punched out a perfect circle where required.

First the splat and half columns were painted flat black and allowed to dry. Fenn's stenciling process was to apply a coat of varnish on the column or splat, allow the varnish to dry to a tack, and then stick the stencil to the object. He used a pounce ball of gold powder to transfer gold to the tacky area exposed by the stencil. I planned to use a water-based sizing instead of varnish because I was familiar with this from gilding, and I used stencil brushes instead of a pounce ball. It took three attempts before I was satisfied with the stencil on the splat. The biggest issue was the gold leaking from under the stencil where it didn't adhere perfectly to the surface. After each try, I prayed that the stencil would come off without tearing, reviewed the result, and then sanded it all off and tried again with a different sizing. On the third try, using Aquasize, the resulting stencil looked good, with very little bleeding and with enough shading to not look brand new (Figure 26). I was amazed at the detail produced by using this fine gold stencil powder. Pin-size holes were reproduced.

Stenciling the columns went smoother after learning with the splat. The column stencil had more detail and had to be repositioned a second time to do the whole column. The same stencil was turned over for the other column to produce a mirror image (Figure 27). Although it was a lot of sticking down and removing for a paper stencil, it remained intact. Clear acrylic sealer was applied and the decorations were done.

Final Assembly and Next Steps

After the restoration the clock was assembled (Figure 28) and set to running because I like to run my clocks. I learned a lot from doing this project, and I wonder if Hotchkiss and Fields and the other clockmakers of the day had any idea that their wood movement clocks would still be running, keeping very accurate time, and looking beautiful 175 years later. I plan to install some authentic metal pulley covers and possibly replace the mirror with a stenciled glass using the Hotchkiss and Fields stencil from William B. Fenn's stencil book listed in the references, but that is for another day, and other clock restoration projects are waiting.

Figure 21. Teeth shaped to correct profile.

Figure 22. Strike great wheel finished repair.

Editor's note: The original version of this article was published in the Summer 2016 issue of The Cog Counters Journal*, published by Cog Counters Chapter 194.*

Acknowledgments

I thank members of Chapter 6 who unselfishly shared their knowledge and experience with me, and especially Andrew H. Dervan, FNAWCC, who was a great help in writing this article. Finally, I especially thank my wife, Sara, for all of the antique shops, estate sales, and NAWCC marts she has attended in support of this hobby.

About the Author

Tom Morris is part of Great Lakes Chapter 6 in the Detroit area. He has been collecting American clocks made in the last half of the nineteenth and early twentieth centuries since 2011. As a mechanical engineer and a woodworker, he has found clock collecting and restoring to be a good fit for his skills and interests.

References

Bailey, Chris H. *More Clock Decorating Stencils of Mid-19th Century Connecticut*. Bristol, CT: American Clock & Watch Museum, 1994.

Fenn, William B. *Clock Decorating Stencils of Mid-19th Century Connecticut*. Bristol, CT: American Clock & Watch Museum, 1984.

Taylor, Snowden. "Characteristics of Standard Terry-Type 30-Hour Wooden Movements as a Guide to Identification of Movement Makers." *NAWCC Bulletin*, No. 208 (October 1980).

Temple, T. E. *Extreme Restoration: A Comprehensive Guide to Restoration and Preservation of Antique Clocks*. Self-Published. CreateSpace Independent Publishing, 2011.

Figure 23. New pulleys turned from maple.

Figure 24. Pulleys artificially aged to match surrounding old wood.

Figure 25. Page from the Fenn stencil book and stencil made for the columns.

Figure 26. The splat after stenciling.

Figure 27. The columns after stenciling.

Figure 28. The finished clock.