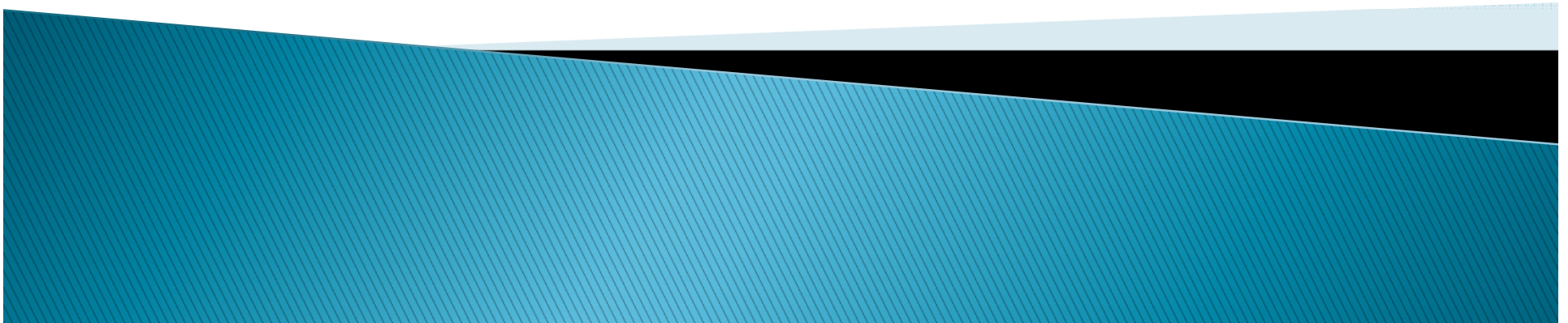


A Better Way to Repivot

Original article by Gordon Ledford in the
December 1994 edition of
Clockmakers Newsletter



The Why and When to Repivot

1. Broken pivot or the pivot is worn beyond dress out.
2. German type movement, 2nd wheel with plated pivot worn and will not clean up.
3. If a replacement wheel assembly is not available.
4. The original is desired for restoration of movement.
5. Save some money?



**The List of
Required Items to
Complete The
Repivot Repair Job**



1. #0 Centering Drill.



2. Blue pivot staff wire or equivalent piano or hardened wire in required diameter.



3. Loctite brand #609 adhesive.



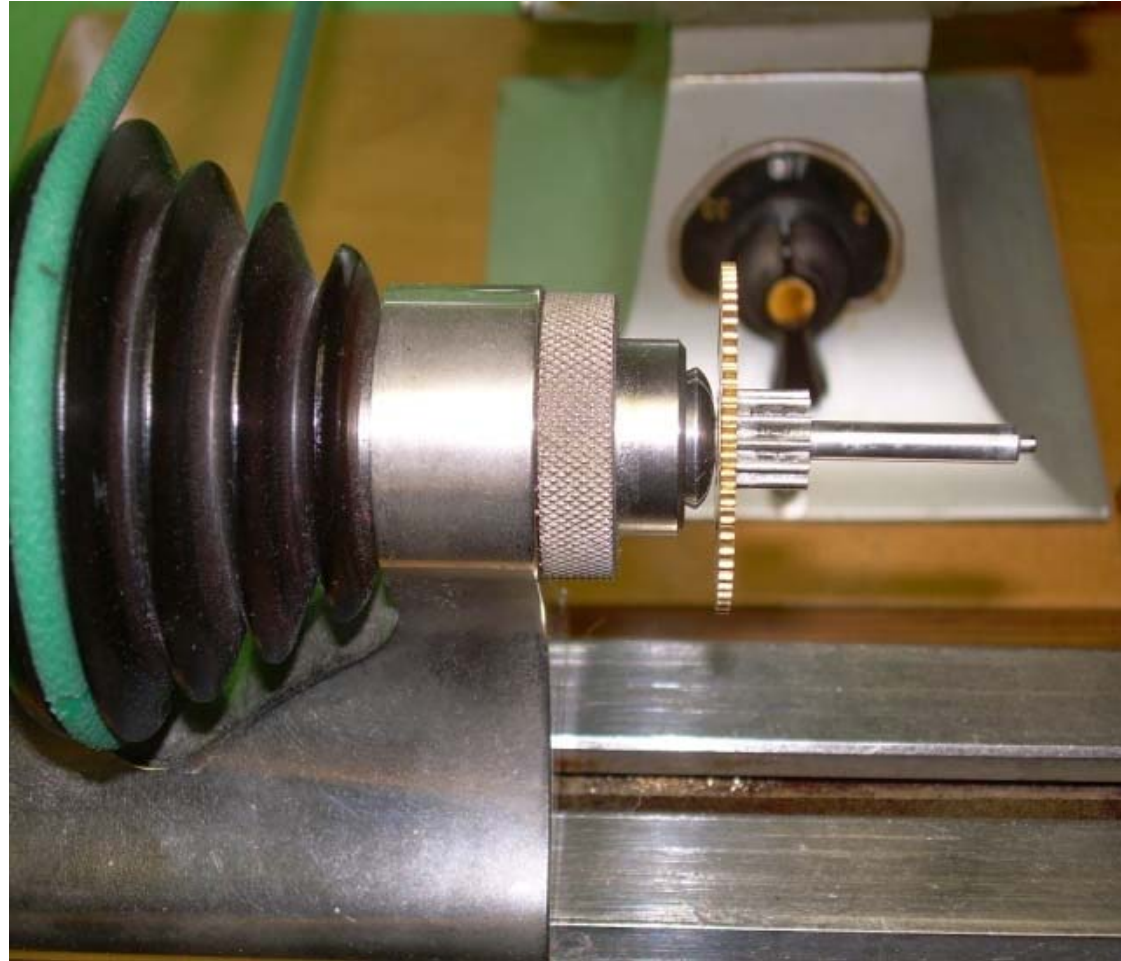
4. Undersize drill to establish initial hole size.
5. Second undersize drill to get as close to the pivot size as required but not equal or larger than the pivot size.



6. Lathe steady rest.

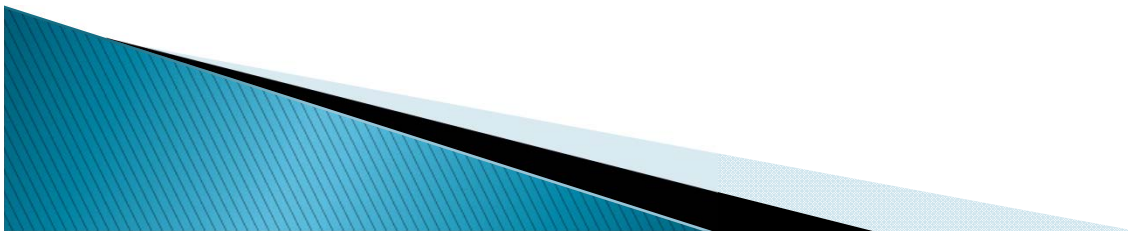


7. Jewelers lathe and collets.



8.

An open mind to
try something new.



Second Wheel Pivot Example

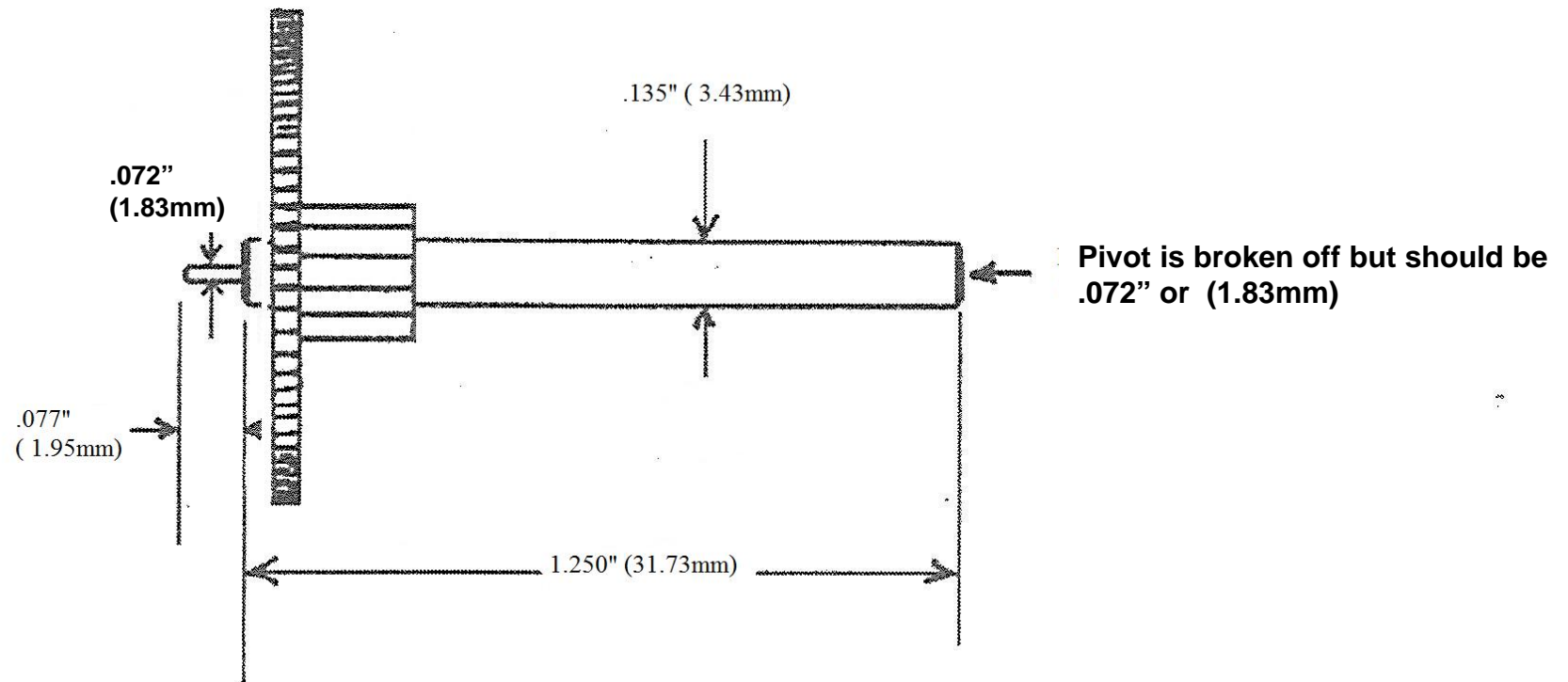
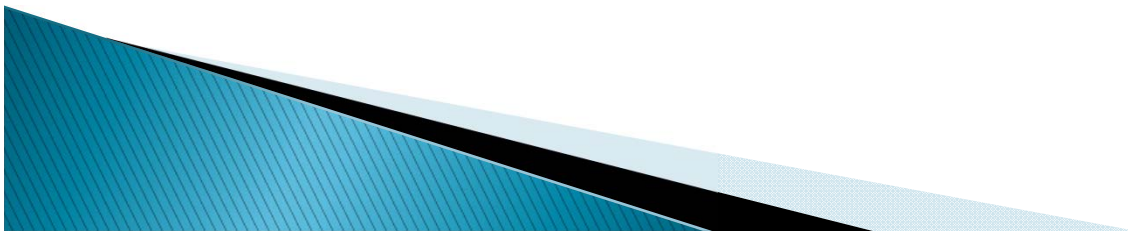


Fig. 1. A broken pivot on a gear with a cut pinion is not designed with the repairer in mind.

Steps in the Repivoting Process



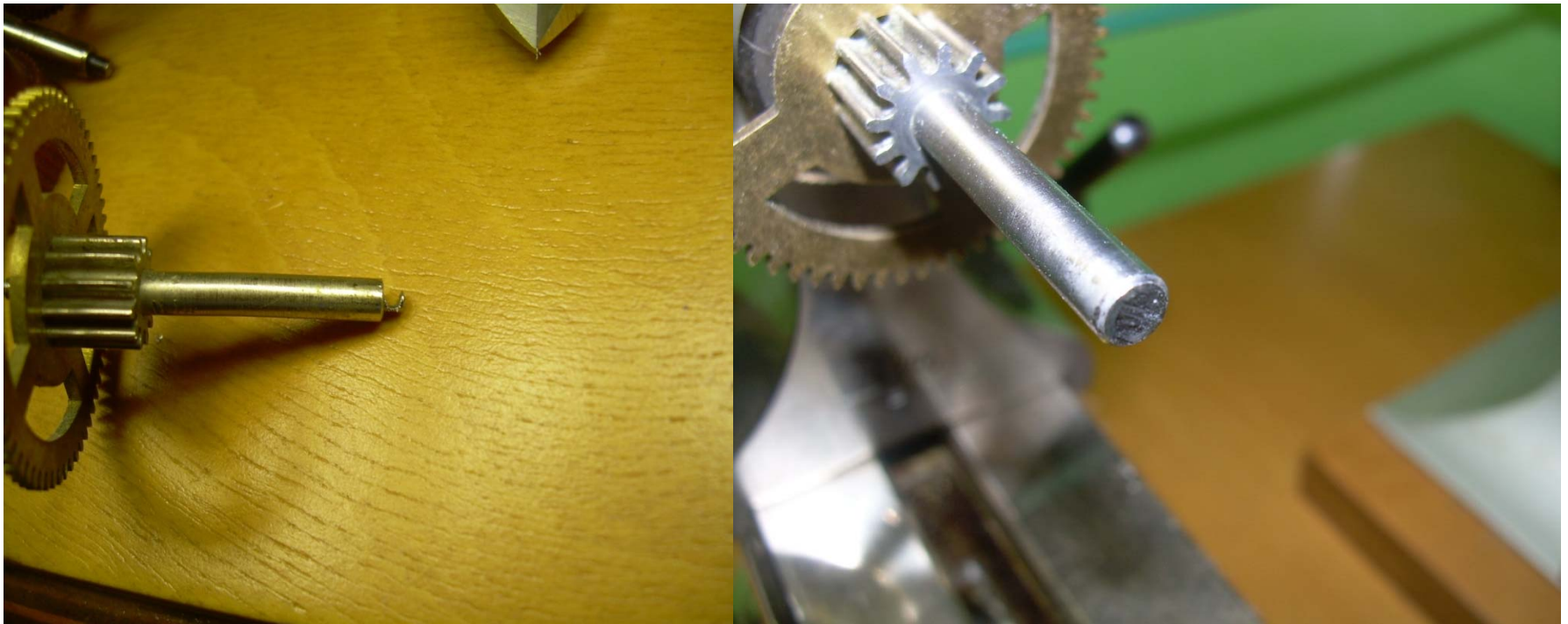
1. Determine size pivot by measuring old pivot. In this case .0725" (1.83mm).



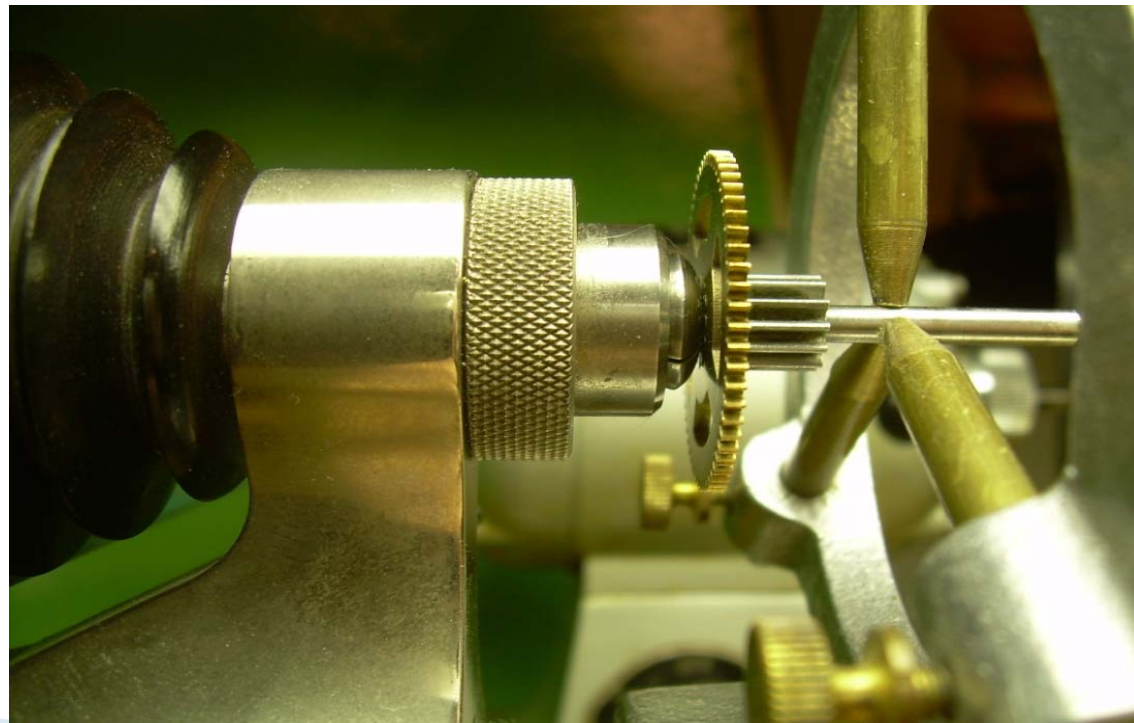
2. Pick out a suitable size blued pivot steel or piano wire for the replacement pivot.



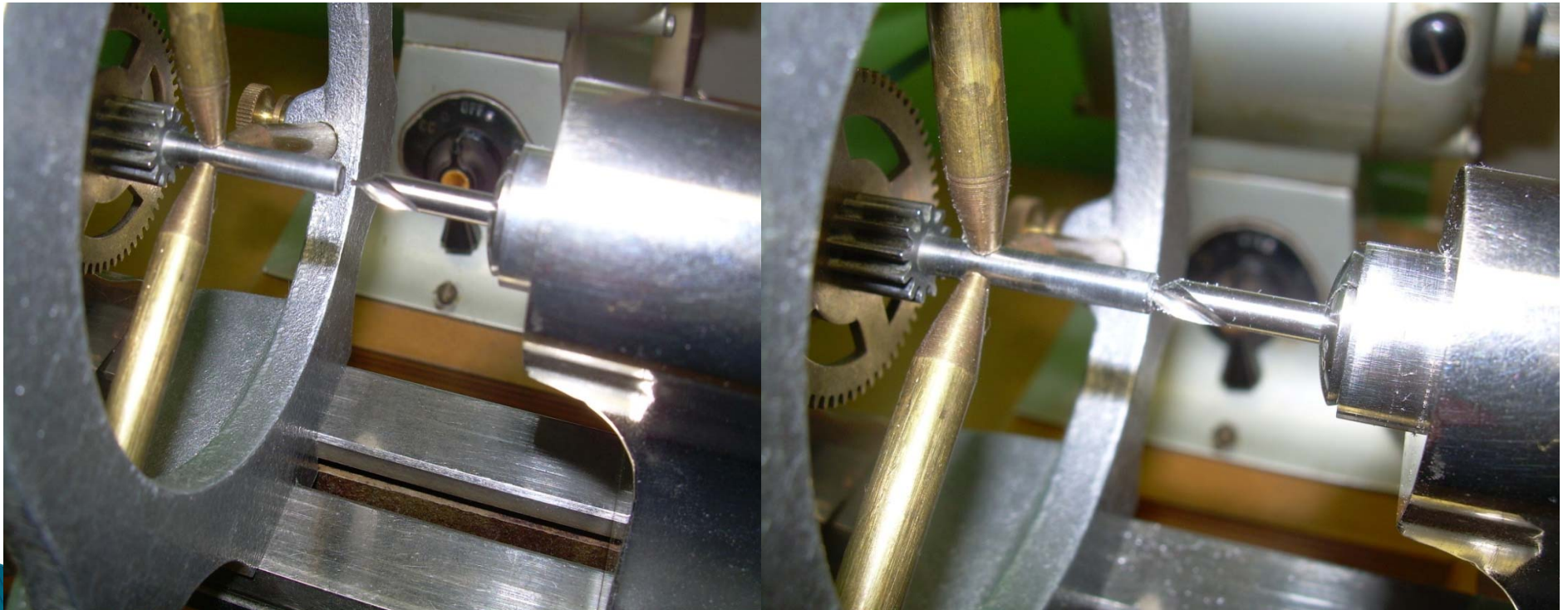
3. Grind off the old pivot down to the arbor shank to allow a for flat surface to start a #0 centering drill.



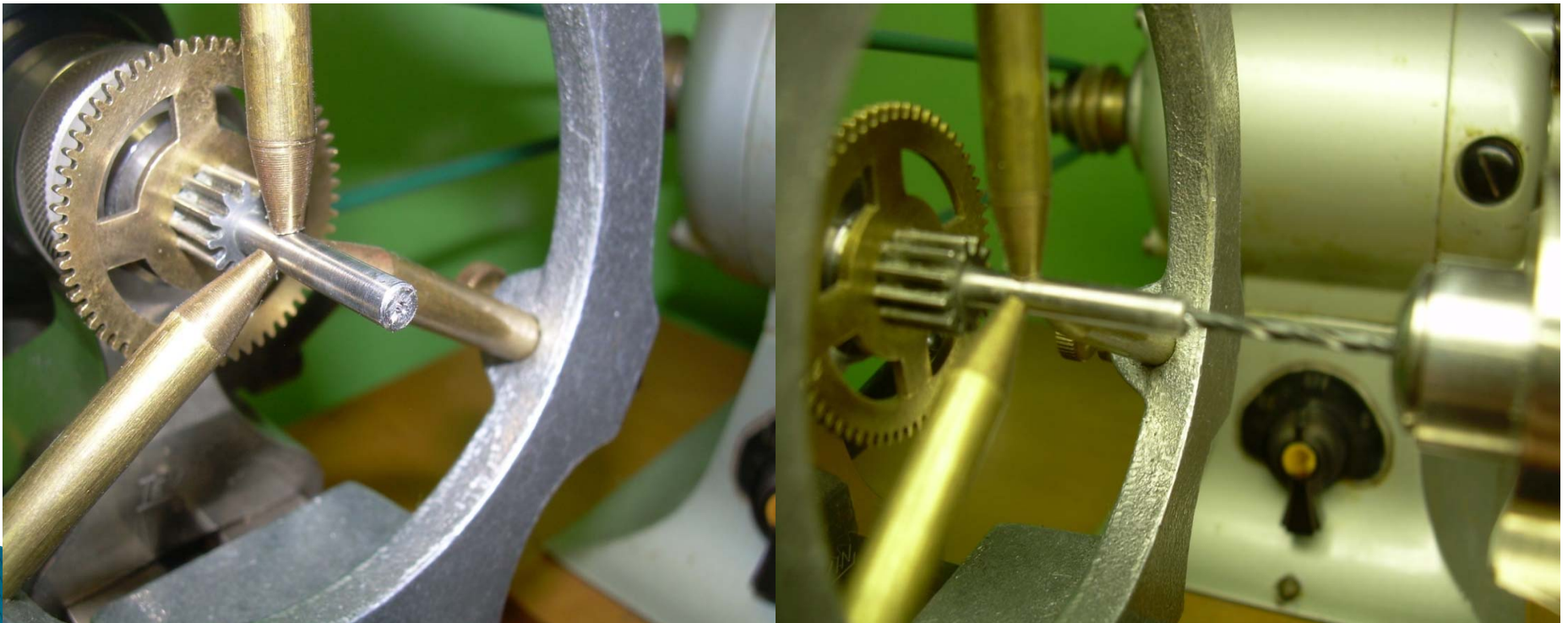
4. Chuck up the wheel in the jewelers lathe and use a steady rest to help keep the wheel arbor concentric while turning. Note: It is best not to remove wheel from chucking for the rest of process.



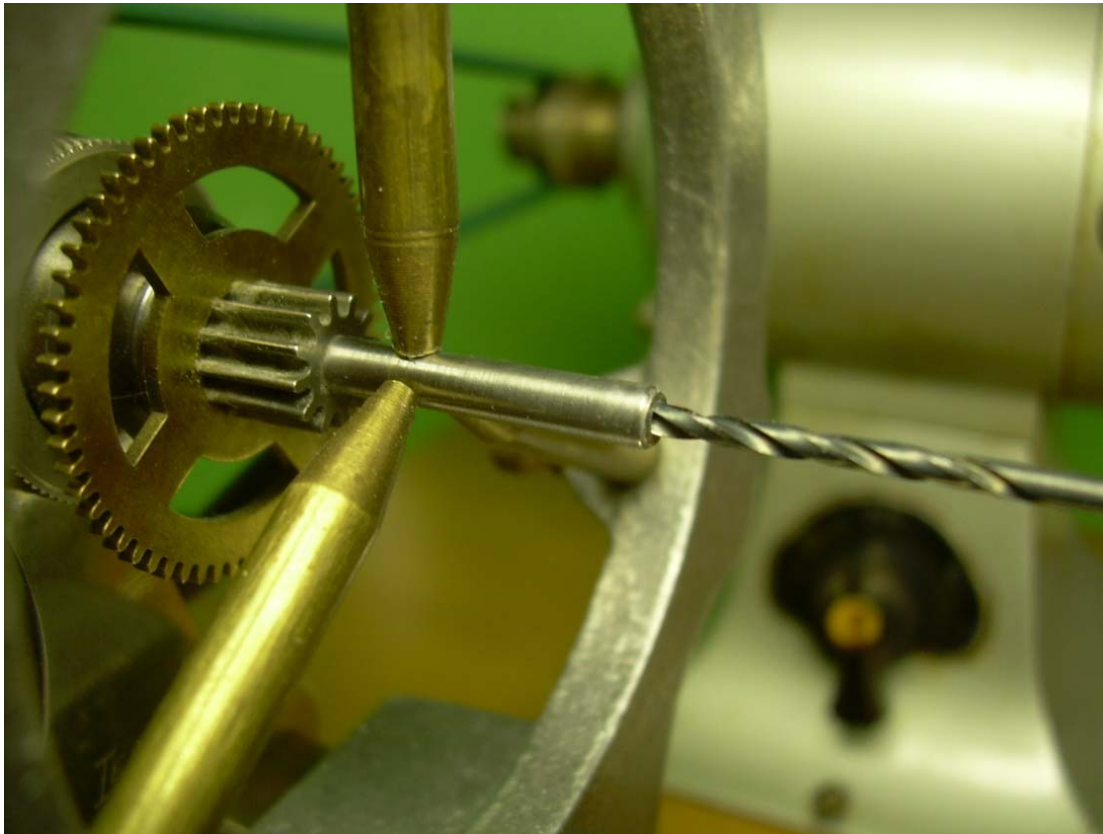
5. With the #0 centering drill held in the collet holding tailstock, drill a centering hole into the arbor. Drill deep enough to get a slight start of the countersink in the arbor.



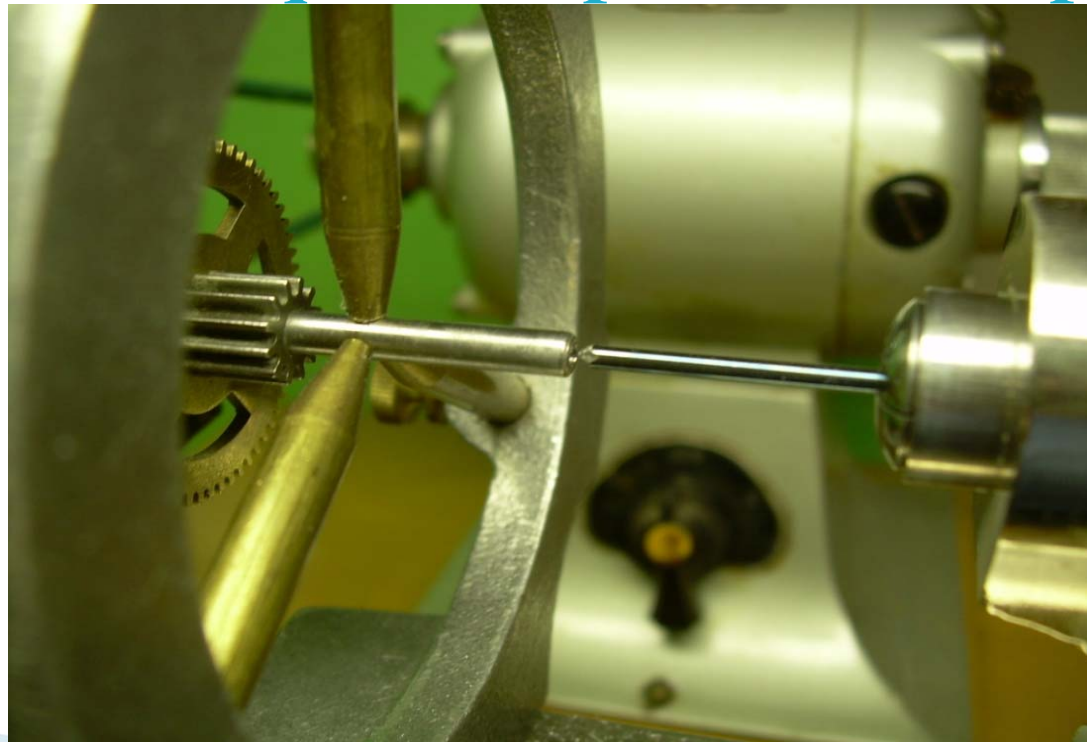
6. Drill the first hole for the new pivot. First drill a #55 (.052"). Drill 1 ½ times deeper than the external length of the original pivot.



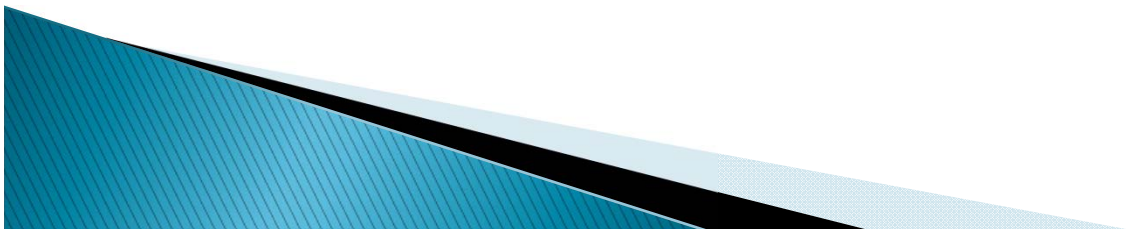
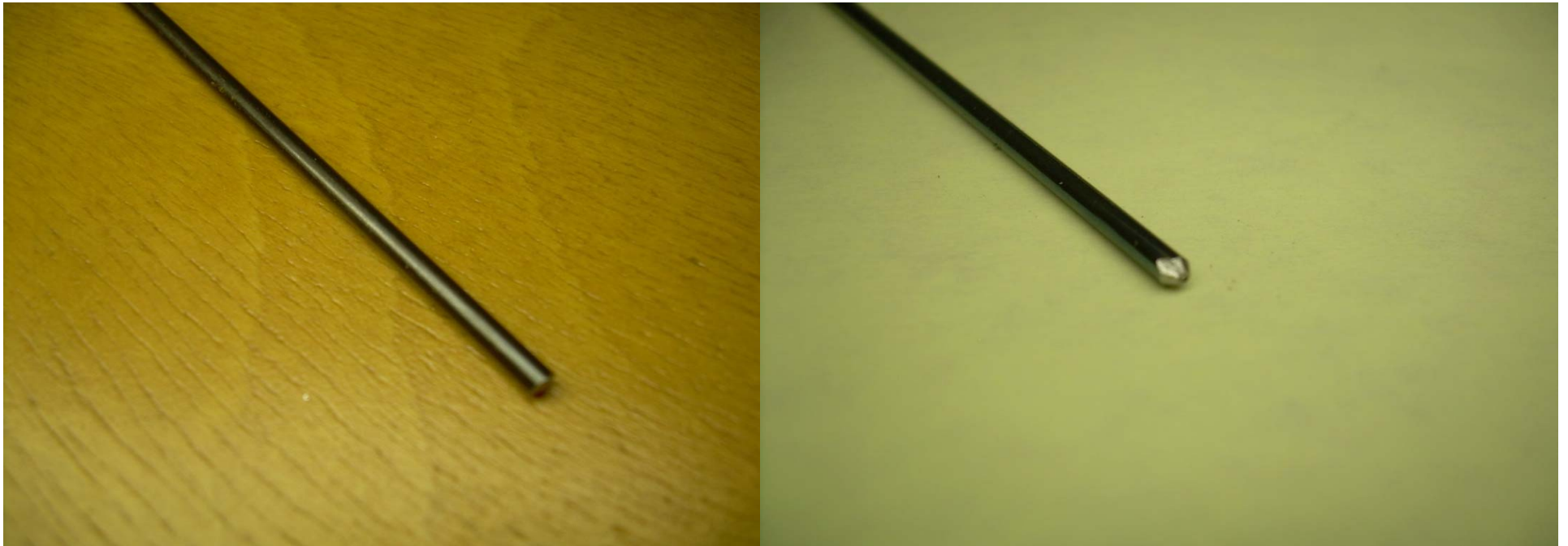
7. Follow up with a # 50 (.070") drill.



8. The hole is now drilled, clean out any chips. Isopropyl alcohol helps to remove any lubricant that may be left behind. Verify depth of hole is of adequate depth for new pivot.



9. Grind a “pivot drill” shape on the end of the blue pivot wire as shown in figure #2. This is critical, the final pivot hole size is “reamed” by the pivot steel as it is turned into place.



The Pivot Steel Final Size

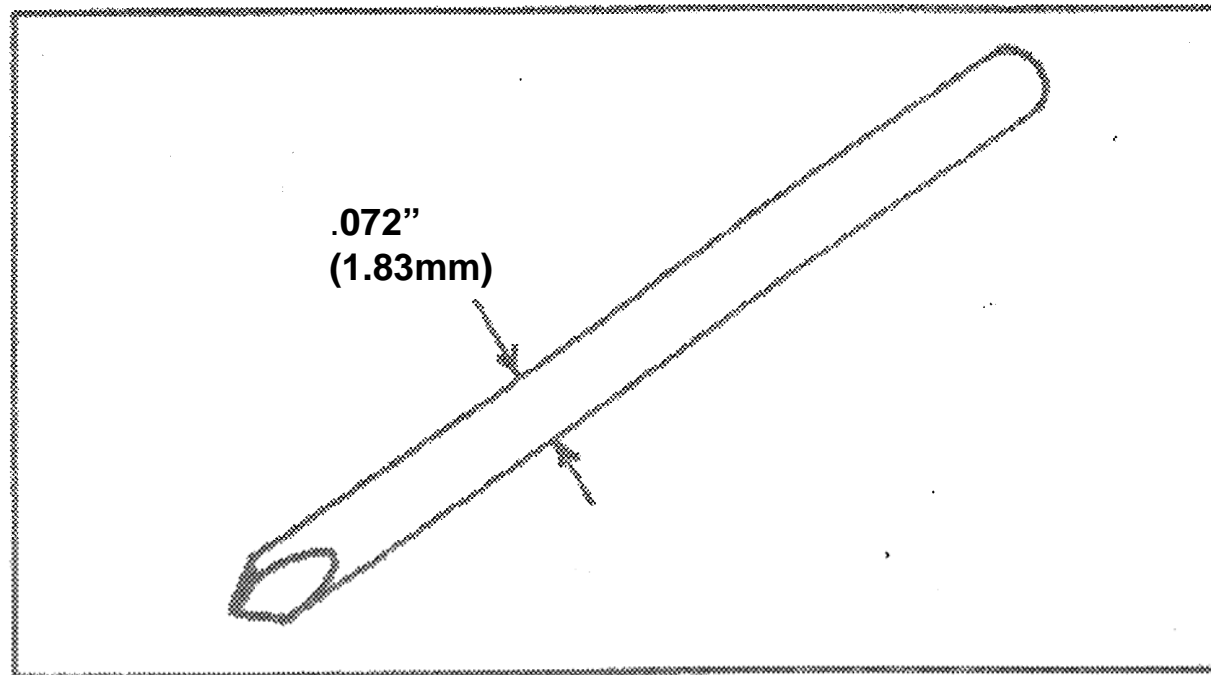
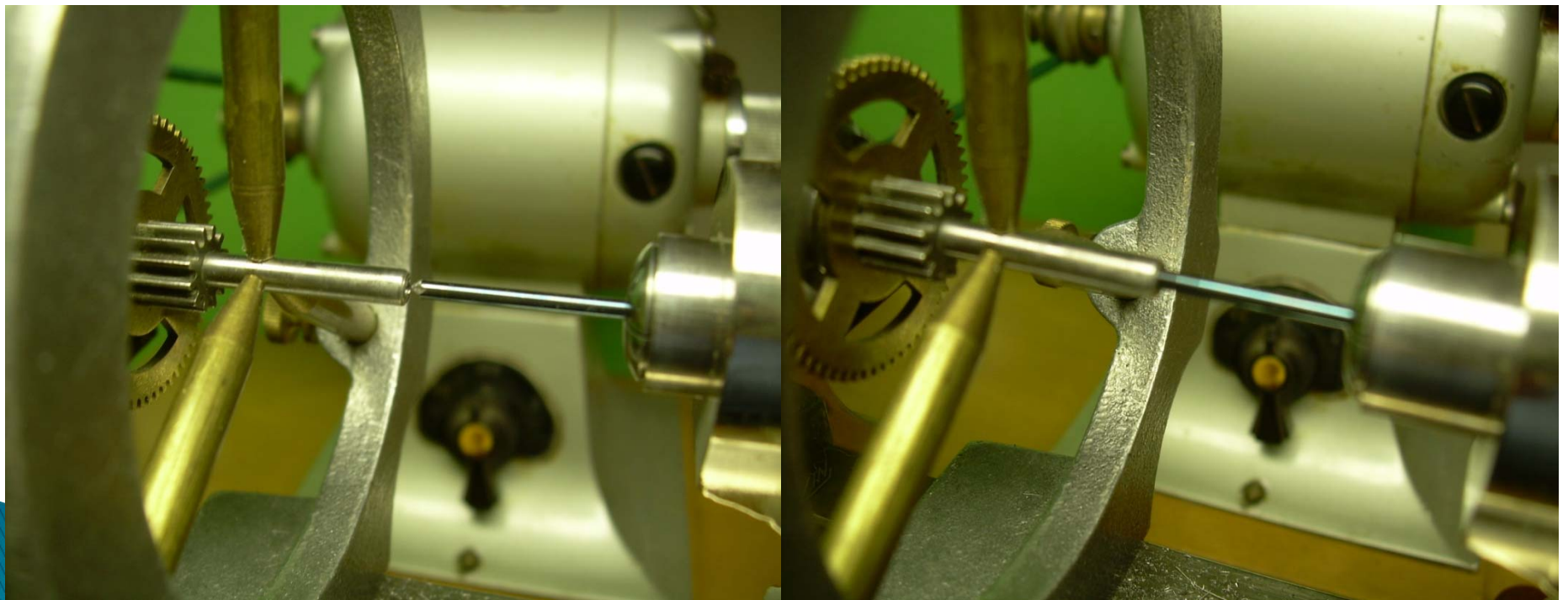


Fig. 2. A "pivot drill" shape can be quickly ground on a tempered blue pivot steel wire.

10. Chuck the pivot wire in the tailstock collet. With the lathe turning the wheel arbor to be repivoted, feed the dressed (pivot drill) end into the arbor until the pivot wire bottoms out. Use caution feeding the pivot wire to not overheat the pivot wire. Remove the pivot wire from the finished hole and clean once again for final assembly.



11. Place a drop of Loctite #609 on a tooth pick and roll the adhesive into the hole with the end of the tooth pick.

12. Place a little Loctite on the pivot end, run the pivot wire into the arbor to bottom and lock down the tailstock. Wick any excess adhesive from the pivot with a Q-tip. Then allow the Loctite to cure 15 minutes.



13. After 15 minutes of curing time, the tailstock can be released. The wheel and new pivot wire can now be removed from the collet.



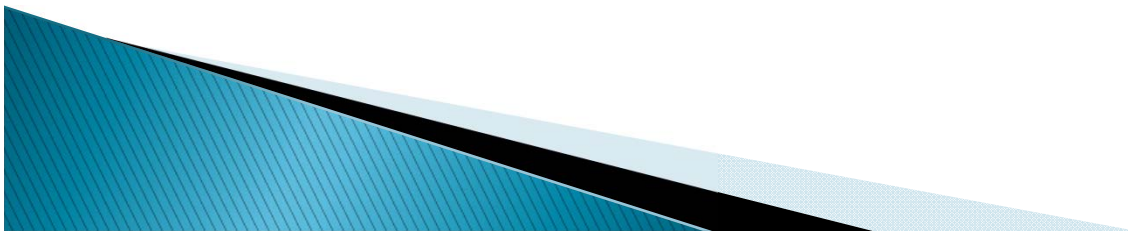
14. The pivot can now be cut to proper length with a abrasive cut-off wheel with a Dremel (Micro) or Foredom flex shaft tool.



15. Chamfer the edge of the new pivot on a grinding stone or with the side edge of the cut-off wheel. Remove bluing from pivot by polishing with 1500 silicon carbide to make the pivot look very close to the original pivot.



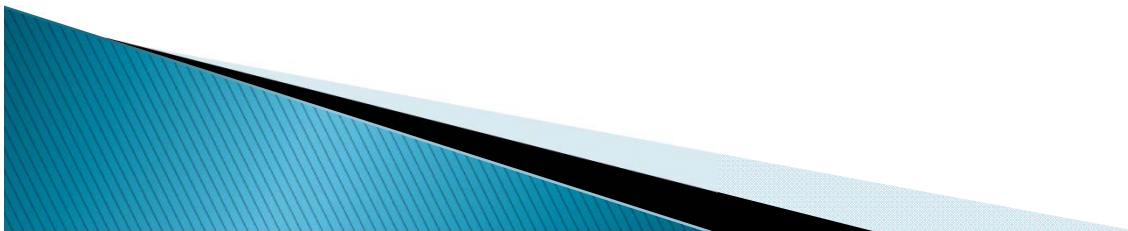
16. The pivot is now permanent. If you need to remove the pivot from the arbor you must apply heat to the arbor to loosen the adhesive. While heating the arbor pull on the pivot to remove it from the arbor (an alcohol lamp works best for the heat source).



17. Now clean the wheel and pivot thoroughly. Re-bush the clock plate to the pivot size of the new pivot and recheck the gear mesh with adjoining gears.
18. Note: The wheel being repivoted should not be removed from the lathe chuck once initially chucked in lathe (to maintain maximum concentricity).



There now! Wasn't that
easy?



Personal Note

- I am somewhat old school in my methods of clock repair. At first I had a hard time accepting the use of anaerobic adhesives in my clock repair. In my professional career of aircraft maintenance, the industry has undergone a transformation of gigantic proportions. From the use of mechanical fasteners (screws, rivets, etc.) and materials (aluminum to composites). The use of adhesives and composite materials to build and maintain transport category aircraft is ever on the increase. As I see more improvements in the world of anaerobic adhesives, I apply them in my work, but still in limited applications. In this application, for pivot repair, I feel that this anaerobic adhesive is a great asset to the repair and have no reservations in using it for this purpose. Common cleaning methods do not degrade the adhesive – only the application of heat will allow disassembly of the installed pivot.

- *“Primum non nocere”* “First do no harm”

Thomas Inman (1861)



Loctite 609 Information

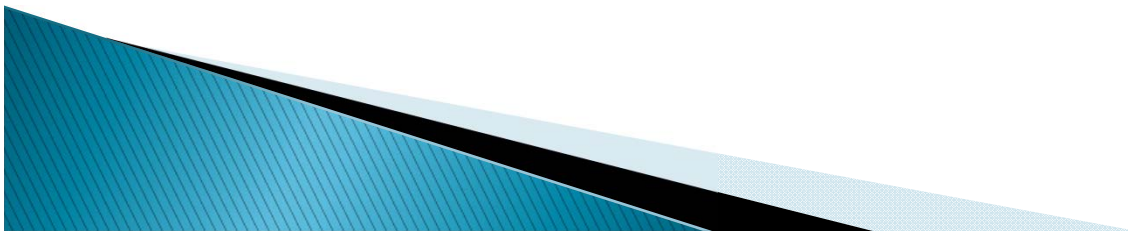


- Loctite 609 Retaining Compound
- Top Pick Loctite® 609™ is a low viscosity, rapid-curing anaerobic adhesive that augments the strength of press fit assemblies or slip fit assemblies up to 0.006" in diameter. Adds up to 3,000 psi holding power. Recommended for parts that will need subsequent dismantling, i.e., retention of bearings onto shafts and into housings. Mil Spec (R-46082B) Type I

Contact Information

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And Now, A Word from Our
Sponser.



Seth Thomas #2 Regulator

- ▶ Timepiece from the Galveston Railroad Museum.
- ▶ Chapter donated a authentic Seth Thomas #2 Regulator for the Railroad Museum to replace this one.
- ▶ This timepiece is very close dimensionally to an actual Seth Thomas #2 timepiece.
- ▶ I am restoring this timepiece for the Chapter August Regional silent auction.
- ▶ This timepiece was converted to quartz pendulum movement. Alas the original movement and items are MIA.
- ▶ Movement mounting holes in the timepiece align with the movement mount.
- ▶ I need your help.



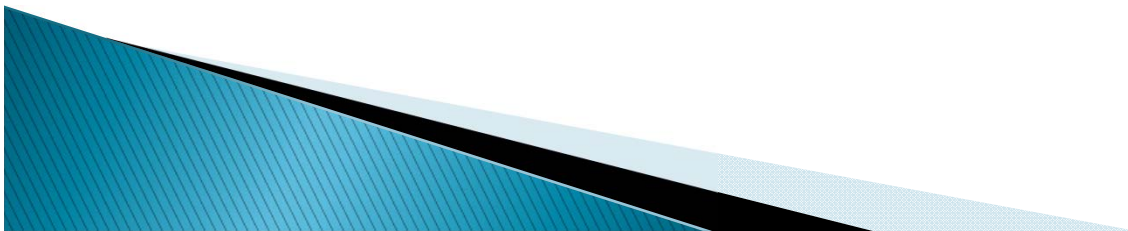






Items We Have

- ▶ Replica Seth Thomas #2 Regulator Timepiece.
- ▶ Pendulum (Marcus Bush).
- ▶ Seth Thomas Weight Pulley (Marcus Bush).
- ▶ Movement Mount and Suspension Spring (Albert Rambaud).



Items We Need

- ▶ Seth Thomas #2 Movement
- ▶ Seth Thomas #2 Dial (Arabic or Roman)
- ▶ Weight

