In the Can—Servicing the "B" Type Telechron Rotor

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Several years ago I had a customer ask if I could fix the chimes on her Revere electric clock. I should have listened to the rest of the story before saying "Yes, no problem". She had taken it to a "repair" shop where she was told it couldn't be fixed because the rotor was bad. The shop installed a new quartz chiming movement and threw the old original movement away. The customer wanted the old sound back since it didn't sound normal!

This scenario is happening more and more as these rotors fail and repairmen find they can't be easily replaced. Even if they happen to have a new-old-stock rotor on hand chances are it won't run long because the oils have dried up. The best thing to do would be to service the old rotor. I've heard of several methods ranging from drilling holes in the can and filling it with oil to various soaking and heating regimes. Although this occasionally works, the results are unreliable. The key is to get "in the can" without destroying it, clean things up, lubricate the movement, and then put it back together.

The Rotor

Fig 1. Two "B" type Telechron rotors. The one on the left is a newer rotor with the can made out of aluminum. Since aluminum is fairly soft, the newer rotor is more likely to be destroyed if not handled properly. The process for servicing the two different rotors is the same, however.

The most common form of the “B” type rotor is shown in figure 1. The early brass or copper can rotors were quite a bit more robust than the later aluminum ones but both will gum up and fail over time. Indications that a rotor is in need of service are: an increase in noise, poor time keeping, gummy oil residue at the drive pivot (Fig 2.), or rotor failure. Both early and late models of the rotor are serviced in the same manner and use the same lubricants.

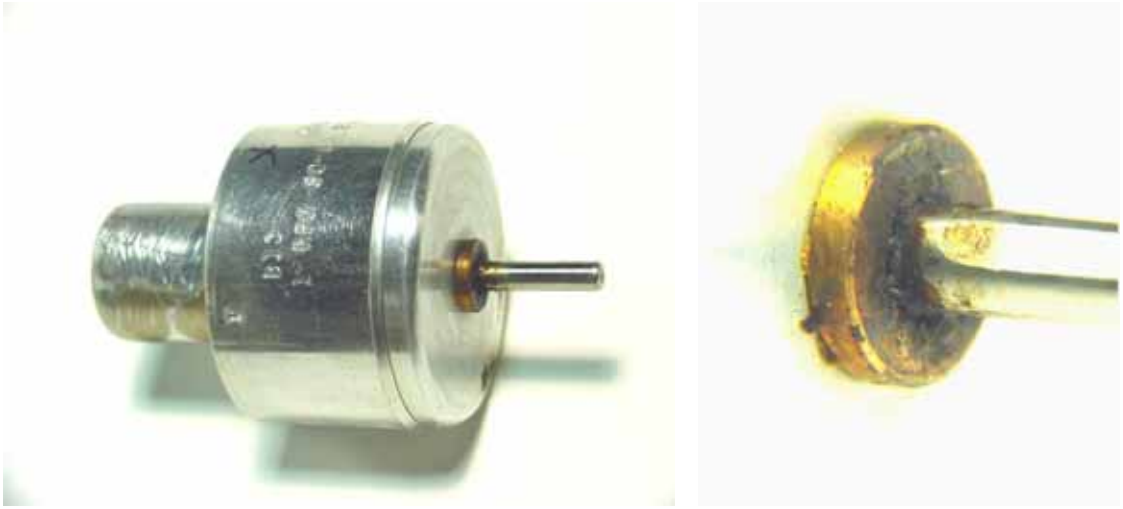

Fig 2. Late model aluminum can rotor before service and close-up of the drive arbor showing gummy residue.

Getting Into the Can

In order to service the rotor movement it is necessary to get inside the rotor can without destroying it. To do that, mount the rotor in a lathe and machine off the peen holding the cap to the rotor body. (Fig 3.) Remove just enough of the peen that the shoulder of the cap becomes visible. The cap should be movable at this point but not removable. It is important to leave the cap fairly tight so it will stay on the body during reassembly. Taking off too much of the peen will result in the body of the can having insufficient material to hold the cap. To separate the cap from the body chuck up on the bushing in the cap with the tail-stock, and using a combination of manual rotation and back pressure,

pull the cap off of the body. (Fig 4.) This process does the least amount of damage, allows the cap to be tightly replaced, and is easily repeatable.

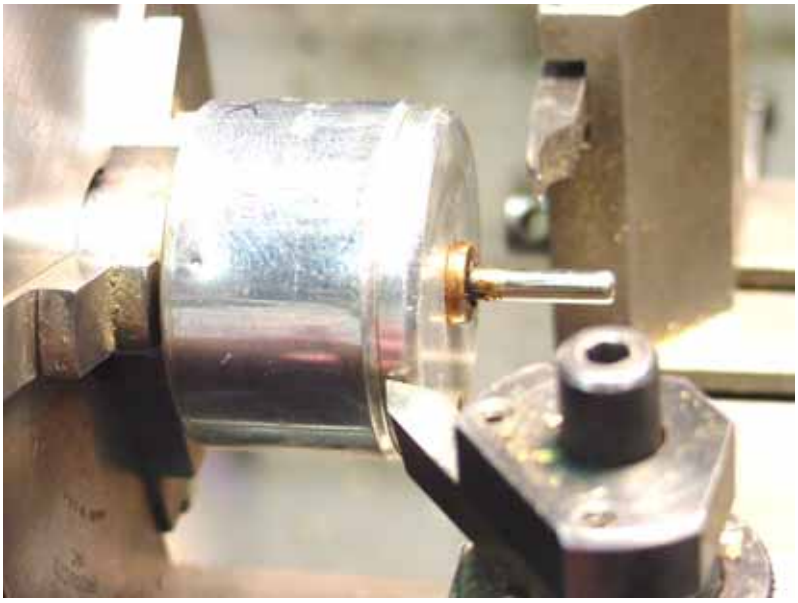

Fig. 3. To remove the cap from the body of the can the peen must first be machined off. Care should be taken not to remove too much material.

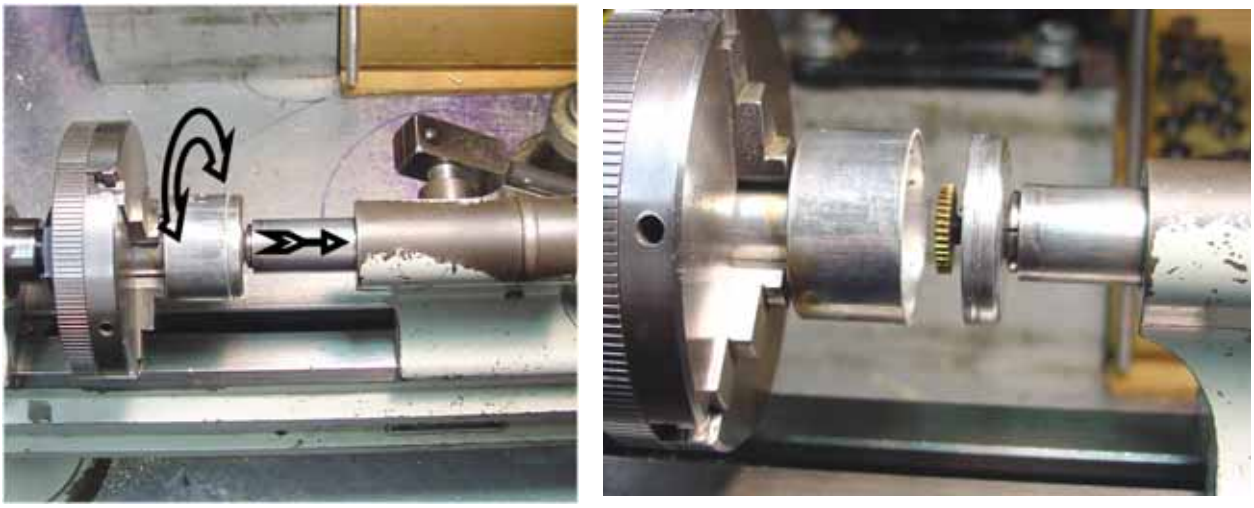

Fig. 4. After removing the peen, the cap can be pulled off using backpressure and manually rocking/rotating the body of the can back and forth.

Removing the Movement

Now that the cap has been safely removed it is time to pull the movement. The bottom plate of the movement is held in place in the body of the can by a series of punch marks in the can. The movement must be wiggled and pulled loose from these pips and it is often best to disassemble the movement while it is still in the can. This will allow you to pry, twist, and apply leverage on just the bottom plate. To remove the top plate, drill out the post rivets with a twist drill. (Fig 5.) At this point it is advisable to draw some pictures so the movement can be put back together properly. Draw the five gears in their proper relationships and lay them on the bench in a pattern that mirrors their positions when in the movement. One of the wheels will remain in the top plate since it has an attached pinion on the outside of the plate. It is unnecessary to take the pinion off of the shaft.

Fig. 5. To remove the top plate, the rivets on the posts must be removed. This operation must usually be done before the movement can be removed from the body of the can. Remove just enough material so the plate can be pulled off.

Once the top plate and gears have been removed it is a simple matter to work the bottom plate loose. Firmly grasp the can body and, using a pair of pliers, work the bottom plate loose from the staking pips. (Fig 6.)

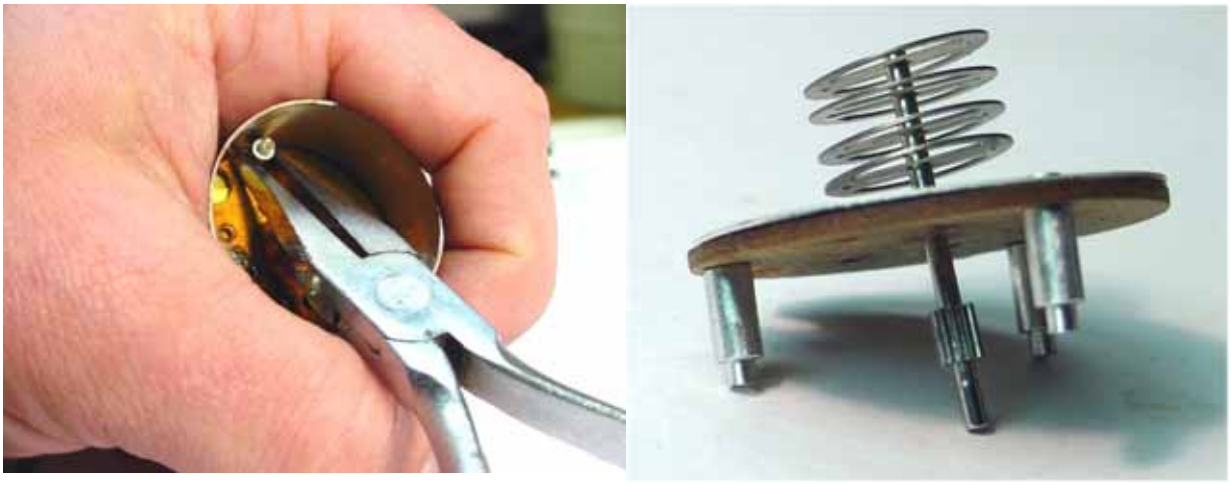

Fig. 6. In order to remove the bottom plate of the movement it will be necessary to pull it loose from the stakes in the body of the can. Grasping a pillar post with a pair of pliers works best.

Servicing the Rotor Movement

The movement can now be cleaned and examined for any problems. The area that needs the most attention is the shaft of the drive gear and the bearing in the cap. (Fig 7.) This is the area that accumulates dirt and will show the greatest wear. Polish the shaft and burnish the part of the shaft that is the bearing surface. The bushing in the cap must also be cleaned and burnished. (Fig 8.)

Fig. 7. The cap bushing and drive gear shaft are the two areas that need the most attention. Both require significant cleaning and polishing for the rotor to function properly.

Fig. 8. Cleaning the cap bushing. Steel wool on a toothpick is useful for cleaning out the old, dry oil.

Clean the old oil off of the rest of the movement, gears, and the inside of the can. An old toothbrush is useful for cleaning the wheel teeth. The top and bottom plates have a lubricant reservoir that must also cleaned. The top plate can be swiveled to aid in the cleaning process (Fig. 9.), but the bottom plate must have solvent squirted into the reservoir through the pivot holes and the old oils leeched out.

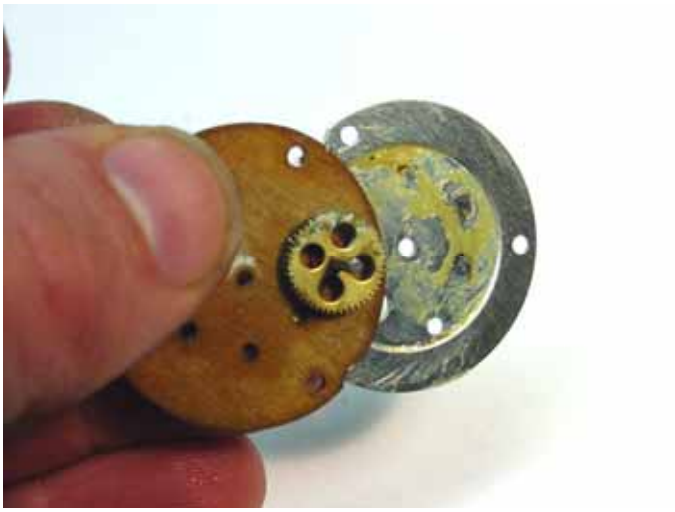

Fig. 9. The lubricant reservoir in the top plate, shown here, is easier to clean than the one in the bottom plate.

Before the movement can be re-oiled the pillar posts will need to be drilled and tapped to accept 0-80 screws to replace the rivets that used to hold the movement together. Using a #56 or 3/64 drill bit, drill into the pillar post about ¼ inch. (Fig 10.) Conveniently, the posts will already have a pilot hole so getting the drill bit centered won't be a problem.

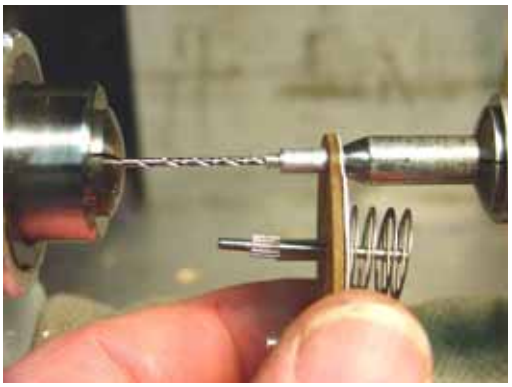

Fig. 10. The pillar posts must be drilled and tapped to hold a 0-80 screw so the plates can be put back together.

The movement will need three brass, cheese head, 0-80 screws. (Fig. 11.) Don't just make three, however! You will find making a dozen screws doesn't take much more time than making three and, in the long run, will actually save time.

Fig. 11. Brass cheese head screws to hold the rotor movement together. Only three will be used, so servicing the next rotor will go much faster since the screws are already made.

Clean out any chips that may have adhered to the movement following the drilling and tapping process. Any chips left on the movement would cause problems later, so look it over carefully. The movement is lubricated just prior to reassembly by filling the plate reservoirs with white lithium grease (Fig. 12.), and lubricating the cap bearing with Nye electric clock oil that has molybdenum disulphate. The Nye electric clock oil is specially designed for electric clocks and is ideal for the drive gear pivot. It is not heavy enough for the plate reservoirs however, which is why the white lithium grease is used. The plate reservoirs should be filled until the grease oozes out of the pivot holes.

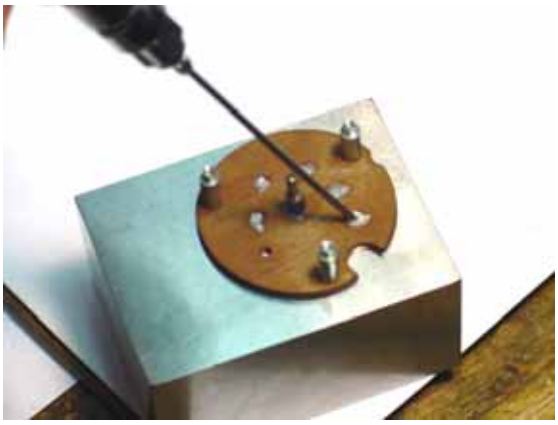

Fig. 12. Lubricating the movement with white lithium grease. Fill top and bottom plate reservoirs until the grease oozes out. The cap bearing hole is lubricated with Nye electric clock oil containing molybdenum disulphate.

The movement can now be reassembled using the newly made screws. (Fig. 13.) Check each gear for end-shake and side-shake. If there is any tightness or a gear free-wheels, the movement may not be assembled properly. It is very easy to misplace a gear or put it in upside-down, which is why notes and drawings are important.

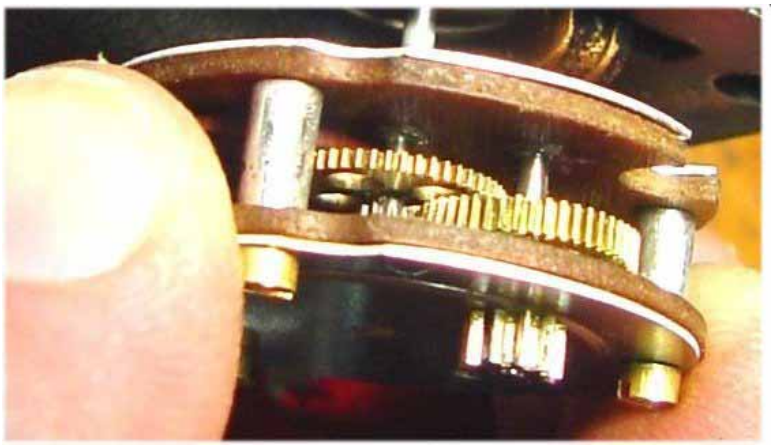

Fig. 13. Freshly serviced and assembled movement. Note new brass screws.

One final step in the servicing process it to adjust the armature. This particular "B" rotor has four discs on the armature but some have fewer. The discs should be adjusted on the shaft so they are spaced uniformly and their spokes are lined up. (Fig. 14.)

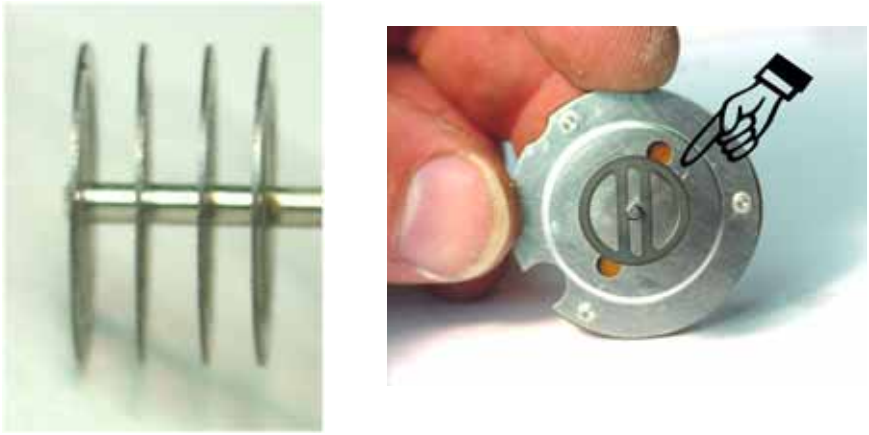

Fig. 14. Adjust the discs on the armature so they are evenly spaced and their spokes are in a line.

Testing the Movement

The rotor movement can be tested by inserting the armature into the field coil, which is held in a vise and supplied with power. (Fig. 15.) With a steady hand and proper location of the armature, the movement should run with a barely noticeable whir. If there is excess noise check for proper lubrication, damaged teeth, or improper assembly.

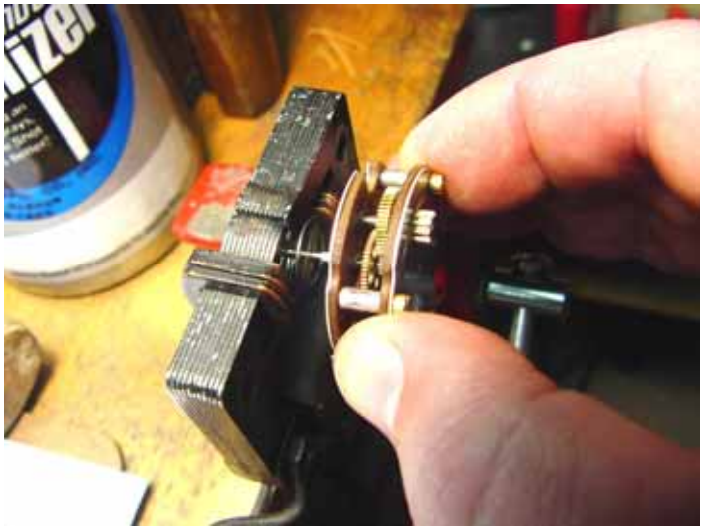

Fig. 15. The fun part! The freshly serviced movement can be tested by energizing the coil and inserting the armature in the magnetic field. Holding it just right allows the armature to spin within the field coil and an easy examination of the working movement.

Final Assembly

The movement is now ready to go back into the can. Line up the semi-circular notch in the plates with the long dimple in the can body. (Fig. 16.) Seat the movement with a flat punch.

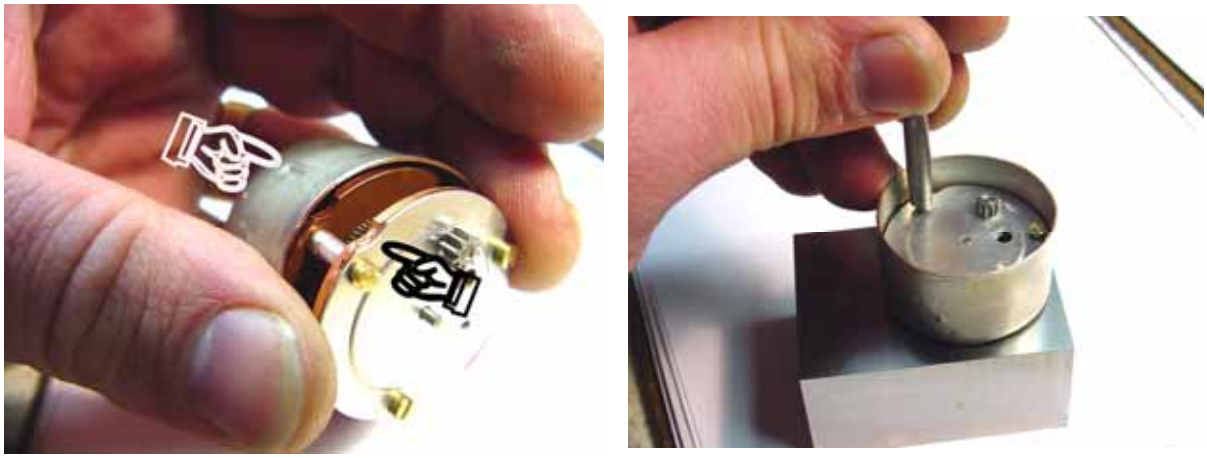

Fig. 16. To get the movement back in the can, align the notch in the movement with the long indentation on the can body. Tap the movement into place with a flat punch on the screws. This will seat the movement into the case peenings.

Press the cap into place with special attention to keeping it square and true. It is advantageous to do this in the lathe in the same manner in which the cap was removed. It is important that the drive gear shaft be true, with very little run-out. Some tapping on the edges of the cap may be necessary. Once the cap is in place, check the drive gear for end-shake. (Fig. 17.) Too little end-shake means the cap is in too far; too much means the cap is not on far enough.

Fig. 17. Check the end-shake of the drive gear shaft. If there is none, the cap is on too tight.

The can may now be sealed using a cold weld compound like J-B Weld. With the can mounted in the lathe, work the weld compound into the seam between the body of the can and the cap. (Fig. 18.) Remove any excess compound and make it look nice and professional. Allow the weld compound to cure according the package directions before using the rotor. Once cured, the weld compound would need to be machined off in order to remove the cap for future servicing of the movement. Removing the weld compound with heat is inadvisable since this would destroy the delicate movement inside the can.

Fig. 18. The final step is to seal the can. A cold weld compound like J-B Weld matches the character of the original material used on some of the older rotor cans. Clean off the excess and make it look pretty!

With the proper tools and knowledge, servicing a Telechron “B” type rotor is fast, easy, and fun! Oh, and about the customer who wanted the old sound back...the original movement was fortunately recovered from the trash and restored. They now enjoy listening to their clock chime and strike, making the same sounds they remember from their childhood.