Miscellaneous Clock Repair Notes:

Chime and Strike Governors in Clocks.
Notes About Herschede Electric Clocks.
Hammond Electric Clocks.

Chime and Strike Governors in Clocks.

- I once thought that the governor on a Herschede grandfather clock, as on other clocks with adjustable governors, needed to be adjusted such that it would be well poised. Then I began to see that some antique clocks had governors very badly out of poise, much worse than Herschede, which was worse than I had seen in Urgos. However, these clocks worked well, and showed the worn pinion leaves to prove their "high mileage," so I had to conclude that the poise of the governor was not important.

- I learned the hard way that the cause of these chime problems was bushing wear, because these heavy governors must cause more wear than feather-weight governors, such as on Hermles or modern cuckoos.

- Now I check the bushings very carefully, using a broach. If in doubt, I automatically replace both bushings. The pivots need to be polished (always: even if they ***look*** good).

- Using a hole-closing punch or a pointed punch to repair a worn bushing makes a round hole out of round and an oval-shaped worn hole even more so. Then the hole is broached open to the correct size, but one still does not know if the hole is round. An out-of-round hole results in an uneven distribution of pressure exerted by the pivot on the bushing wall, which when contaminated with a foreign particle could cause pivot scoring or binding.

- Some clockmakers like to fit a pivot to a bushing as tightly as possible without binding, as if a Sessions were a L'Epee. The design needs to be considered, such as the thickness of the plates, the sizes of the gears and pinions and their tooth sizes, and the position and function of the gear in the train. If the gear and pinion are at one end of the arbor, the adjacent bushing should be tighter than the one serving the other end of the arbor. If the bushing is adjacent to the gathering pallet, it needs to be tighter to avoid chime or strike problems, particularly on Herschedes. The governor bushing adjacent to the pinion needs to be tighter than the one at the other end, but it needs to be looser on a Hermle 340-020 strike train than on the chime train because the strike governor pinion is bigger than the chime governor pinion and depthing of smaller pinions is critically important. So how tight a bushing should be varies from gear to gear, bushing to bushing, and clock to clock.

- If I expect governor problems, all I do is replace the bushings, polish the pivots, ensure the depthing is correct, and adjust the governor blades so that they look symmetrical. If a clock is correctly overhauled, the governor poise will not be a problem. Poising is for balance wheels.

Herschede Electric Clocks.

- The coil springs on the Herschede electric clock are like those on the Revere Telechron movements. The spring on the chime activating lever appears to be the same as the one on the chime gear lever. The latter is on the back plate and it pulls the gear away from the centerwheel. The reason why one overcomes the other is because the radii upon which they act are different. The radius of the former is greater than that of the latter, so that the former exerts more TORQUE than the latter. I have used springs from old mechanical typewriters and adding machines without any problems. There is, however, one very important problem I have encountered with these springs. They are all three or more times more powerful than they need to be, and the spring on the chime activating lever causes premature wear of the centershaft bushing towards the left (#9), so that the hands may touch the dial on the left side and the glass on the right side.

- A new replacement (as of 29 July 1999) for the Telechron "B" type motor assemblies is being sold by Merritt's (part #1492) that looks good in the advertisement because it is considerably less expensive than the rotor it replaces and claims to have 20 times more torque. This product is too good! I would caution repairers not to use this product because of this unprecedented excess power: since most customers are likely to run their clocks until they stop before bringing them in for repairs and maintenance, such a severely overpowered motor is likely to destroy the clock before failing itself. A good clock will fail before it self-destructs, whereas a severely overpowered clock will continue grinding away. A replacement like this would only be acceptable if the customer were to bring the clock in for maintenance every four to five years: however, since the vast majority of customers neglect their clocks even more than they neglect their cars, this replacement is likely to result in many ruined clocks. Furthermore, some repairers replace the rotors without properly overhauling the clock because the Revere Telechron movements with Westminster chimes are unorthodox and very complicated in design (few repairers understand them). Such repairers might be tempted to use the new, extra-powerful replacement to overcome existing wear in the clock and make sure the clock runs long enough for the repairer's warranty to expire, grinding away. Unless this product were quickly removed from the market, which I regret is unlikely, we should expect to see many badly damaged electric clocks in years ahead!

Hammond Electric Clocks.

Many electric clocks have motors that are no longer available, so repairers are unable to repair them and, lamentably, resort to converting them to quartz. The Hammond motor is one.

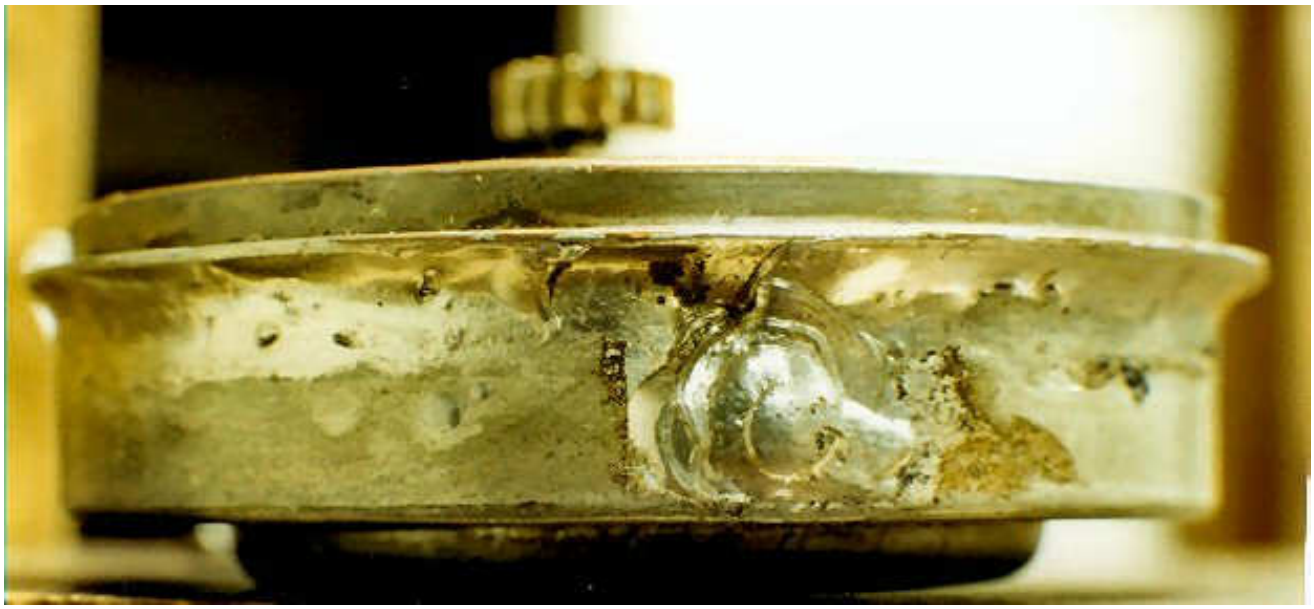
I was given one of these clocks and, since it did not run, I took the motor apart because I had nothing to lose. The best way to do this is to place the outermost edge against a stone grinding wheel, all the way around, removing about 1 mm. of circumference (see photos below), and pry it apart with a screwdriver. One side of the case has an extra quantity of solder which covers up a lubrication hole: pry open from the other side. The two brass plates inside are riveted together: grind off the rivets, of which there are four, and pry off the back plate. If you grind off just enough rivet to remove the plate, it would go on friction tight afterwards and this would not come apart by itself. The only thing that seems to go wrong with this motor is that the rotor is relatively heavy and this weight wears out the brass hole until the rotor rubs on the frame just next to it, stopping the clock. To remove the rotor, it is necessary to remove the 2nd gear with a staking tool or a punch. Clean all the parts thoroughly: automotive brake cleaner in a spray can works very well because it leaves no residue and is a very powerful solvent. Install a bushing at each end of the rotor, lubricate with a quality oil formulated for electric motors. You could mix a small amount of moly graphite

grease with the oil (about 5%) for better results. Lubricate all the teeth of the bakelite (?) 2nd gear next to the rotor and its post. Be careful because these teeth are very fragile. Install a small steel washer between the 2nd wheel and the back plate to reduce friction because of wear in this area. Press the brass plates together again, stake the 2nd gear together again as it was, and place the exterior cover on again in the same position as before. I sealed the exterior with a piece of woven glass fabric insulating tape, but a piece of heat-resistant electrical insulating tape would work nicely.

Five years later, I got another Hammond clock, which got the same treatment. Judging by the way it was built, it will probably run as long as a Checker cab, certainly longer than any plastic quartz contraption.

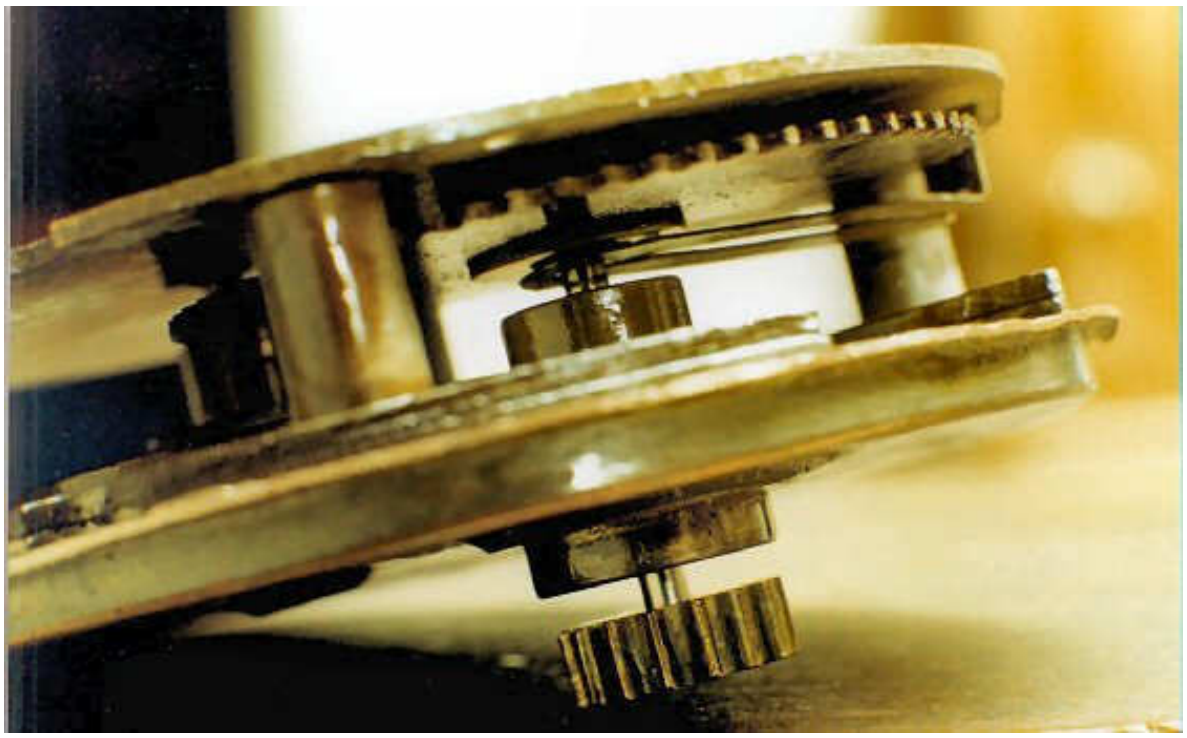
BACK COVER OF MOTOR

SIDE OF MOTOR BEFORE GRINDING EDGE

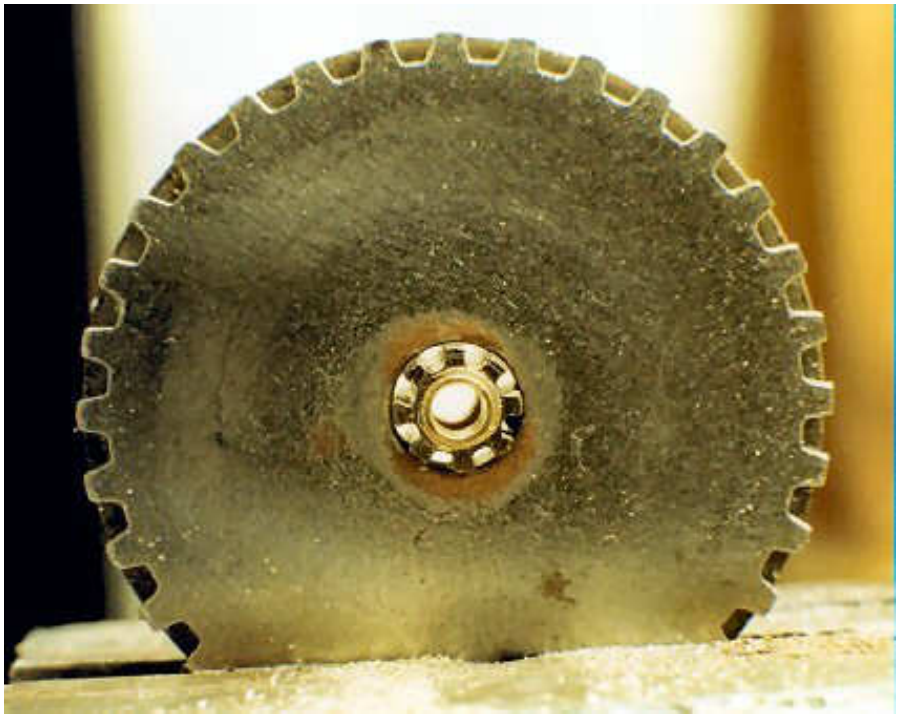


SIDE OF MOTOR AFTER GRINDING EDGE

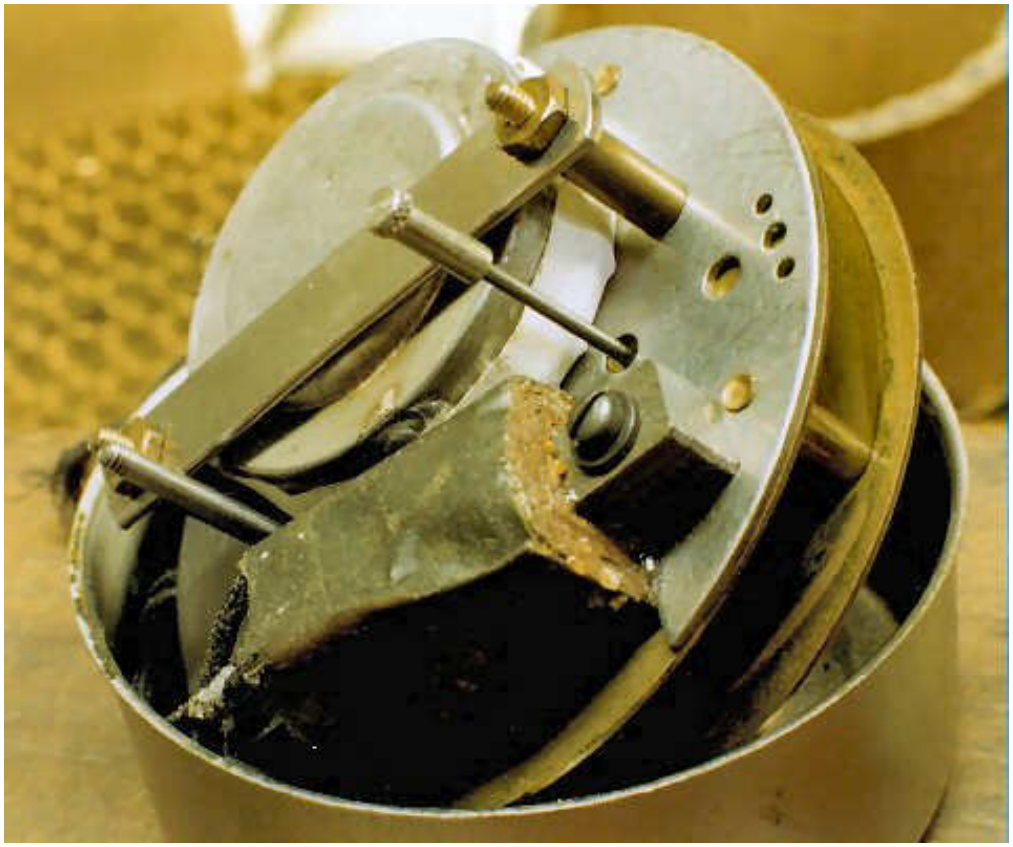
VIEW OF 2ND WHEEL INSIDE MOTOR



ROTOR WITH BUSHINGS INSTALLED



MOTOR INSTALLED IN CLOCK



Mark Headrick