Restoration of Darche 1908 Flashlight Alarm

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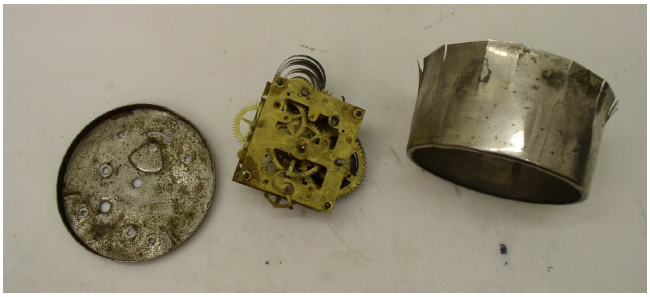
The Darche Manufacturing Company was a Chicago, Ill. Company that seems to have started its existence out of the Chicago Fire of the 1870's. It survived until the Great Depression in 1929. While short-lived, the company produced multiple patents and became a real innovator in battery-powered alarm clocks. Several interesting models, some with walnut cases but most in heavy nickel-plated steel cases, have been identified by others.



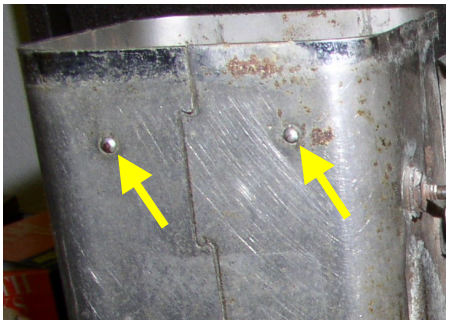
The subject clock for this restoration is shown above. In great disrepair with rust and corrosion throughout, the challenge was to bring it back to life.

The basic idea behind the Darche Flashlight clock is fairly simple. The alarm key is replaced by a winding lever which, when the clock alarm activates, turns and causes contact with an electrically "hot" C shaped bar, closing the alarm circuit which activates the electric bell. See figure to the left. (We have Vince Angell to thank for this figure since our clock had no alarm winding lever present). The light on this particular clock was on a separate circuit and did not activate with the bell. A separate remote switch, tethered at the end of a cord, could be kept near the bed, under the pillow, etc. In the dark of night, the button could be pressed to illuminate the dial. The No. 6 battery was stored in the right-side "silo" can out of sight. Some of the Darches used two batteries, and these batteries mounted outboard behind the two cans. But this particular clock stored the battery internally.

Several enormous challenges with this clock are noted. First, the clock movement can is split all the way around its perimeter. It will have no part to play in a quality restoration and there is no

way to repair it. A new can would have to be fabricated. Second, not quite visible from the pictures, is the corrosion resulting from battery leakage over the years. There was not a single wire that could be reused due to corrosion, dry rot, or other problems.

The case itself is built like a tank. It is constructed of very heavy gauge, .068" thick cold rolled steel which has been stamped, bent, formed and dovetail joined (quite the contrast to the .015" thin drawn brass can housing the movement). Tabs coming through the base are bent over to secure the silos. The clock movement can is cleverly held in place by draw bars (visible in the picture above) that are tightened by nuts on the bottom to sandwich the clock between the two semicircular cross members acting as clamps.



As received, the front door combination lock was jammed shut. The internal mechanism would not turn with the knob so there was no way to get the door opened! This would not prove to be a big problem for me since the door rivets would have to be drilled out and removed anyhow, but could be a daunting challenge for a new owner if this was not the case. The silo had internal panels that were likewise riveted in place. These would have to be removed for restoration so that all corrosion and repair could be carried out. The buzzer coils, contacts, armature, etc. were also riveted in place and would need to be ground away for removal, drilled and tapped for replacement.

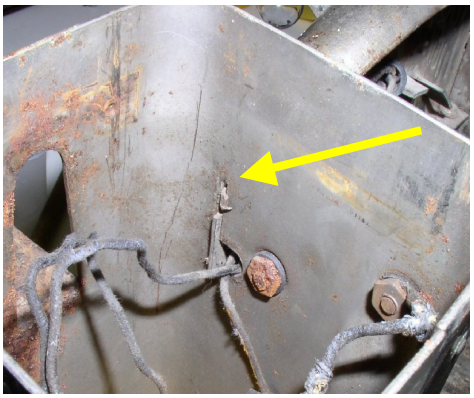
At the time of receipt, our plating tanks did not have the size capacity for this job. We have a small scale horological plating setup. The initial plan was to send out to have the larger parts plated. Unfortunately through the course of things, it proved difficult to find a plater familiar with the required restoration process and its relatively conservative nature in comparison to restoration of automotive parts that they are more familiar with. It therefore became evident that we would have to up-size the tanks.

It was clear that this was going to be a big job. It was my first Darche restoration. Restorers' remorse was beginning to set in. The balancing act was going to be to resist over-restoration. However not having been in 1908 at the time these clocks were built, it would be hard to judge. We'd have to play it by ear.

Disassembly. The task of disassembly began with difficulty. The .068" thick tabs securing the silos proved to be an enormous challenge. Sharpening a screwdriver to a wedge afforded a tool to pry them up. This was followed by straightening with pliers. These tabs did not bend easily (lower left). Would they survive bending back down to re-secure the silos, or would metal fatigue get the better of them? Hopefully they would survive, but we wouldn't know that until we were almost finished with reassembly.

A possible option for the tabs is to scribe a line where the tab meets the underside of the base, and then once disassembled drill holes in the tabs for taper pins just at the scribe lines. The advantage of this is it would allow as many disassemblies of the unit as desired. The tabs would

never need to be bent over again. Speaking now with hindsight, this is what I would do if I were to start over.



Another problem was the bent tabs inside both cans, utilizing the top cross member to pull the silos together. There is no way this would survive removal. I thought about drilling holes for a draw bar between the left and right silos. Ultimately I elected to forego the idea, since the clock was rigid enough and the silos properly aligned with no assistance. It could be an option if the silos had an outward tilt, as there is clearance behind the upper cross member to accommodate this.

After either drilling out or removing the rivets holding the base of the "bank" unit internal to the left silo, the door and all buzzer rivets and coil yokes, the unit was disassembled into its parts and the restoration could finally begin.

Plating. We use 180 grit brown aluminum oxide to media blast all of our steel parts in preparation for plating because it never blurs fine details. This was one time I wished we used something more coarse. It took quite some time to wear away the corrosion, rust and plating. Each part was a project in itself, taking 2 hours or more at the sandblaster. All told, it was a couple days' work just to strip the parts. After stripping, each part was pre-polished with a Britex wheel. This left a "butler nickel" finish on the parts, many of which still had some nickel remaining after media blasting. This is how they would enter the copper tank.

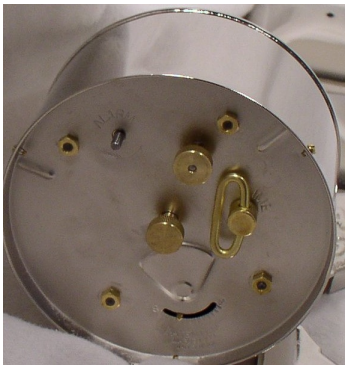
It was interesting to note that there was very little copper found under the nickel. The nickel was extremely heavy and did not come off easily. This wasn't really a problem since the EPI E-Brite Ultra Cu formulation we use can plate over nickel quite well. The corrosion and rust was very slow to remove, but ultimately every part cleaned up very well. I felt a sense of encouragement as the parts were removed from the copper bath, fully plated and ready to restore/polish.

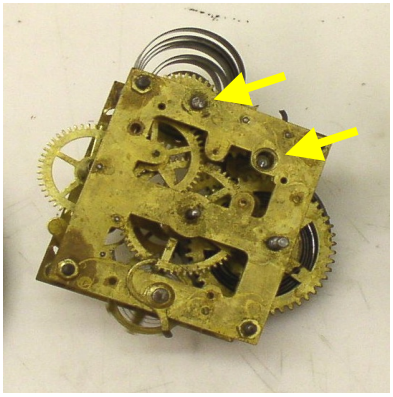
Very few parts required solder filling. The base was in the worst shape of any part. Examination of sections of plating that were not damaged indicated many original blemishes in the factory finish. In an attempt to avoid over-restoration, some of the blemishes were left. There was a general texture to the metal that I did not want to lose. Applying one coat of copper did the job very nicely and provided a buffing layer that worked adequately for everything except the base.

Some of the internal parts were badly corroded. In general, this is inconsequential as long as the corrosion is removed and none of it passes through the part. We were fortunate. All of the parts were reusable, despite clear evidence of battery leakage eating away at internal components. One hour in the nickel tank and the parts were ready to go. Every part, down to the last screw, nut, lug and gadget, was cleaned, pre-polished, and nickel plated. The nickel plating took two 14 hour sessions to complete, not including the clock can.

Shown below are the results of the first plating session. Another plating session completed the movement can, door and knob (which needed to be reconditioned on the lathe to restore the shape and knurl). The bank draw bar, nuts, screws, alarm winding lever, and some other small parts are likewise not shown but were likewise plated.

Clock Case. The topic of how we refabricated the clock can is worthy of a separate article. It was very time consuming, taking nearly a full day to complete. The basic idea is to start with a strip of brass about .018" thick, and bend it into a can shape around a form. The joint is closed with another strip and some simple rivets. Once completed, it does have a seam that the original did not have, but it is invisible underneath the clock, hidden from view. Exact measurements are key to assuring that the friction tight back fits just snugly. A front bezel is "spun" on the lathe and is then soldered to the front, forcing the shape of the can exactly round. Test fitting, trimming, and drilling for mounting screws are followed by polishing and plating. The brass can does not require the buffing layer of copper.





Clock Movement. Likewise the movement restoration was quite involved on this unit. The "Before" picture is shown to the right. It required a new alarm main wheel arbor, and alarm setter arbor as well. Both were sheared off and the parts missing. Again I will not go into a detailed explanation of what it took to engineer the missing parts. The thread required a 5-40 LH tap and die. The alarm setter arbor and knob required a 3-48 RH tap and die. Both the setter knob and arbor were fabricated at the same time. Getting the length and protrusion from the dial required substantial trial and error. The result is shown to the left. Clearance to the hour hand was critical. Another point about the movement: a stop pin needed to be added near the center wheel pinion. This pin was not in the original design. Without it, the mainspring would impinge on the center wheel, stopping the clock long before it was unwound.

Here is the finished product fully assembled. I think you will agree that if you compare before vs. after, it is a clear indication of how beautiful these clocks once were.

One of the most important elements in the restoration is the presence of all major parts. Also, with the exception of the clock can, it was key that there were no cracks or splits in any of the remaining parts.

Frankly, we've had other units in the shop for restoration, which we refused because numerous parts were missing, dented, cracked, etc. The cost to repair these would have exceeded the customer's budget. We have seen units with badly corroded bases. Again, the cost to restore these is excessive. It's interesting how much damage we have been able to repair, but there are limits.

How much cost is involved? A typical project will exceed $1500 and could approach $2000. But if you are a great fan of these clocks, this might not be out of your range. Other customers have certainly felt this way!