



Small Shop - Big Results

Rx for Mice—Pulling Out All the Stops!

Part 3: Restoring the Keyframe—(In for a Penny, In for a Pound!)

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By spending the amount of time that we did treating the keybed of the 1915 Walworth upright in our shop for restoring, (Journal, May 2011) the tone was set for the remainder of the work to be done on the piano. One doesn't, after all, bring out the fine china and sterling silver flatware for a special meal with friends, only to end up serving dessert using Styrofoam® bowls and sporks.

Now that the keybed was complete, my attention turned to the keyframe and keys. The damage which had been wrought by the colony of factory/farm mice was extensive, and drastic measures were once again called for. A simple brushing off of the debris was not going to cut it. Before diving headlong into a project which was sure to consume countless hours, however, I was determined to take a careful look at things to see if there were ways to save time without sacrificing quality.



Photo 1: Corrosion which was more than skin-deep.

The first thing I considered were the balance rail and front rail pins. There was absolutely no doubt what needed to be done—replace the lot! Actually, this would result in a savings in time compared to the inordinate amount of time that it would take to polish all the crud off. While there would be the small material expense for the new pins, the deciding factor was neither that, however, nor the offsetting saving of time, but rather the fact that no amount of work on the buffing wheel would completely restore either set of pins to anything approaching acceptable condition. The pitting and corrosion of the metal surface of the pins was too deep (Photo 1).

The condition of the keyframe itself was a mixed bag. Right off I noticed that there were two species of wood used in constructing the frame. The balance and front rail were maple. The back rail and front-to-back supporting members were a softer, lighter wood, most likely basswood. The difference in wood had been noticed by the mice as well. The corners of the basswood members were heavily chewed to the point of compromising the structural integrity of the frame (Photo 2). I've seen keyframes with this type of damage simply fall apart when one attempts to lift the frame and the keys out of the piano.



Photo 2: Gnawed.

The maple front and balance rails, on the other hand, were practically untouched by the mice. Except for two very small spots along the edge of the front rail, there was no noticeable damage. Apparently the mice detected the difference in hardness, and preferred gnawing on the much softer wood.

Dave noticed another difference as well. Holding the soft wood up for a smell and comparing it to the smell of the maple rails, the urine odor was much stronger for the basswood than for the maple. This would make sense in that the softer the wood, the more porous it would be and the more urine would soak in over the years.

With all these factors in mind, I decided on what seemed the best course of action. First, the balance and front rail pins would be removed, for later replacement. Next, the frame would be disassembled into its component parts. The back rail and front-to-back supports would be duplicated out of new wood. The two maple rails would be given a thorough cleaning and would be reused.

I felt comfortable with this plan. While I had cut new front to back supports for keyframes in the past and had no problems whatsoever, I had as yet not had occasion to try duplicating either a front rail or a balance rail for a keyframe. While this is certainly a procedure I would be game to try, it is something I would much rather do on a piano belonging to me than a customer.

One last step in my “exploration phase” of the process was to consult with the technicians who post on the pianotech e-mail forum, for ideas and tips that they might

have about the procedures at hand. The wealth of knowledge represented in this forum makes it an ideal source of alternate methods to consider. Even when I'm doing a procedure I'm perfectly familiar with, it's interesting to see how others approach the same problem.

A specific question I had was in looking for an easy way to safely remove balance rail key pins. In the past, I had resorted to Vise-Grip pliers, which will take out the pins with some twisting and turning, but I was sure there must be a better method that would not have the effect of distorting the hole (which had happened to me on occasion). I posted the question, and sure enough, there were other approaches. David Ilvedson, an RPT from Pacifica, California, came through first with a simple yet effective approach. His suggestion was to turn the rail upside down, and punch the pins out with a nail set. I tried it and 'Voila!' it worked. I was thinking 'pull' when I should have been thinking 'push.' Let me just state for the record, "Duh."



Photo 3: Punching out the pins.

With that advice, I was off to the races, so to speak. The balance rail easily detached from the rest of the frame (the only thing holding it in place was the center pins which intersected the front-to-back supports). Using a block of 4 X 4 to support the rail (Photo 3), I quickly punched out the entire set of pins using a ball peen hammer and a squared off roofing nail. (The nail sets I gathered up from around the shop all had too much of a taper, and wedged in the hole.)

Once the pins were removed, I used a small palm sander to take off the urine stains from the mice.

Safety tip: Before sanding, the rail should have been handled with proper protective gloves, and wiped down with a solution of bleach water, or comparable sanitizer to kill any existing Hantavirus. After drying, the sanding may have done while wearing proper breathing apparatus and protective clothing.



Photo 4: Quick and easy.

Compared to the amount of time and effort it took to properly sand the keyed, sanding the balance rail (Photo 4) was nothing at all. The stains had not penetrated into the wood, but rather were just on the surface. Five minutes of work with the sander progressing from 100 to 150 to 220 grit sandpaper and the balance rail looked as if it had been cut from new lumber (Photo 5).



Photo 5: No apparent stains, and no detectable odor!

With the balance rail ready to set aside for the time being, I went to work on the front rail. The front rail pins, while not quite as badly corroded as the balance rail pins, still were in need of replacement. Since the holes for the front rail pins do not go all the

way through the rail, as is the case for the balance rail, they did need to be pulled out (Photo 6) rather than tapped out from underneath.



Photo 6: Pulling out the front rail pins.

The method that worked the best was to set the pair of Vise-Grips so that they would firmly lock on to the oval pin, then pulling straight backwards while twisting back and forth. I focused on keeping the pin always in line with the hole, and not pulling or pushing to the side, which could elongate the hole.

With both set of pins removed from the keyframe, I knocked apart the rest of the component parts, sanded the front rail in the same way that I did the balance rail, and began duplication of the other parts.



Photo 7: Gauging thickness.

With a large supply poplar on hand on my lumber rack, and a bit more structural integrity for poplar when compared to basswood (26 lb./cu.ft. for basswood, 31 lb./cu.ft. for poplar), I decided to switch to the slightly stonger wood. It still is a very easy wood to work, making it ideal for duplicating parts. Using the old parts for the pattern for the new, I began by setting the fence on the band saw to the thickness of the original basswood parts (Photo 7). (The advantage to resawing on the bandsaw, as opposed to simply planing the wood to thickness on the planer, is that instead of ending up with sawdust for the portion not used, you have some thin pieces of lumber left over for a project down the road [Photo8]).



Photo 8: Resawing the poplar stock.

From the bandsaw, the next stop was at the table saw, where the pieces were ripped to the correct width (Photo 9). Again, the old parts were used to set the fence on the saw.



Photo 9: Ripping to width.

Each of the five parts being duplicated (back rail plus four front-to-back supports) was cut to length on the mitre saw before being shaped for the joints connecting everything together.

The middle two front-to-back supports had tenons on both ends that fit into mortises which were cut into the front rail and back rail. These would need to be cut. The side front-to-back supports had lap joints which also needed cutting.

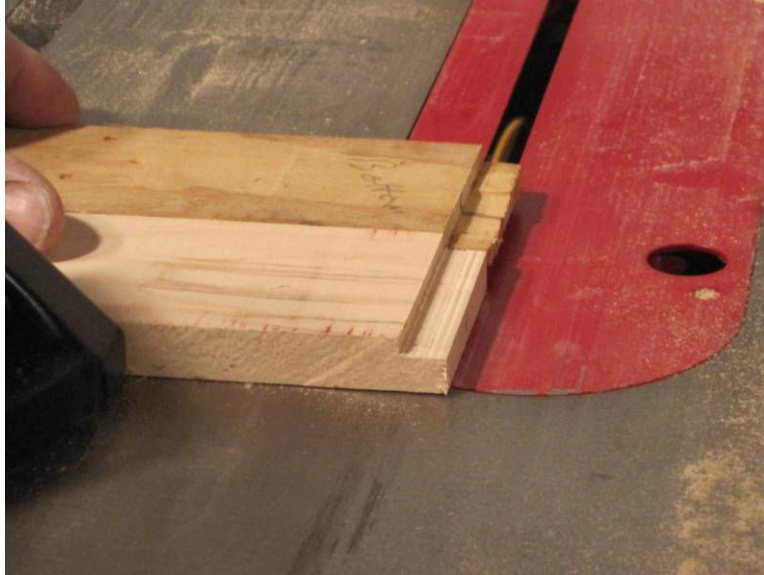


Photo 10: Cutting tenons.

Although I cut the tenons on the table saw (Photo 10), a better choice of tools for this job would probably be a router, which would result in smoother cheeks for better gluing. The final cutting procedure was to notch out the back rail for fitting the keyframe around the action support bolts.

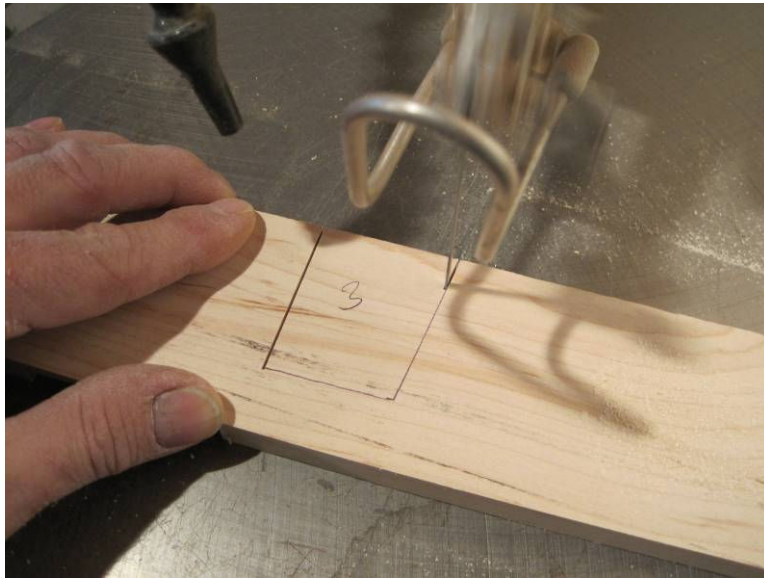


Photo 11: Notching for support bolts.

With all the parts cut and fitted, glue was applied to the joints and the entire assembly (minus the balance rail) was clamped together and allowed to dry overnight (Photo 12).



Photo 12: Nearly completed keyframe.

The next morning, the clamps were removed, and the balance rail was returned (but not yet glued into place).



Photo 13: Balance rail is installed.

The keyframe, minus pins (Photo 13), ready for the next step. Next month: balance and front rail pins are installed, along with new felt all around, and the whole assembly will be returned to the piano.

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