Schaff Piano Supply Company Presents:

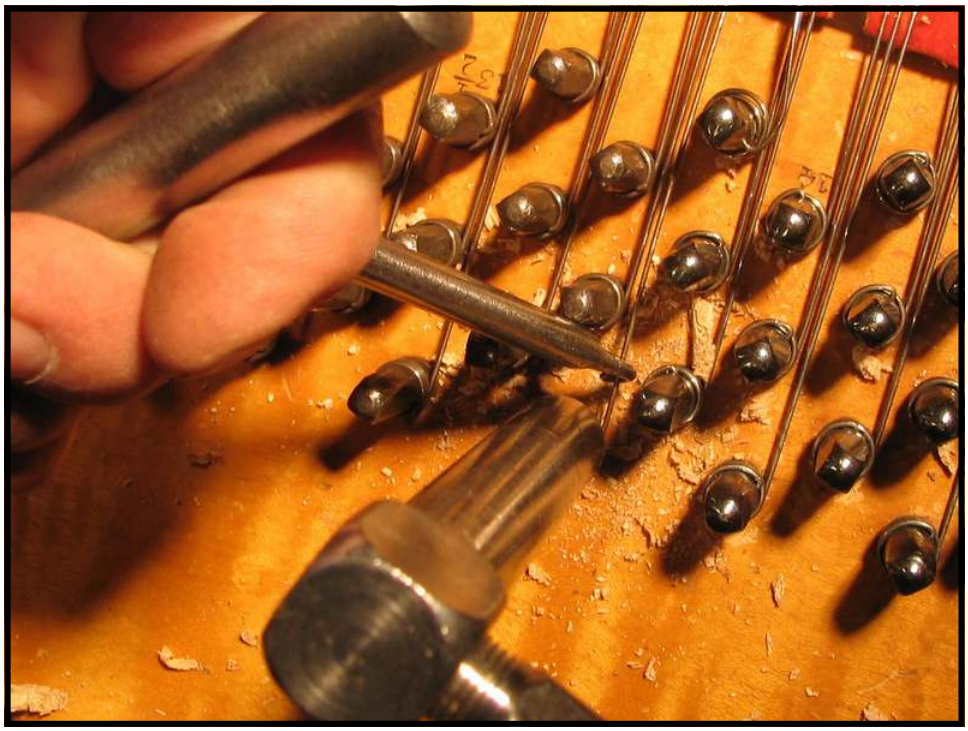
Repinning the Upright Piano

Basic Step-by-Step Procedures

Belly Work

By Chuck Behm

Repinning an Upright



-Rationale-

Although repinning and restringing a piano often go hand-in-hand, there are occasions when, for reasons of economy, repinning a piano while retaining the original strings might be the preferable course of action. Especially in pianos that have a problem with tuning pins that are too loose to hold, but strings that are neither brittle in the treble, or too "tubby" sounding in the bass, a simple repinning job will give the owner the most improvement for their investment.

For technicians who live in areas of the country where heated air in the winter leaves many pianos with tuning pins with less than desirable torque, an understanding of the entire range of options for dealing with the problem is essential. Whether the decision is made to apply a pin tightening solution, to shim, to repin with oversize tuning pins, to install pinblock plugs, or to install an entirely new pin block and new factory size pins, understanding the correct procedures for each technique is vital if one wishes to provide a professional service.

Following are the step-by-step procedures used to repin a piano in a situation where the original strings are retained.

Before you begin . . .

A repinning job is not something someone should jump into without due consideration. It is time-consuming for the technician, and expensive for the owner of the piano. It is worth the time to sit down with your customer and talk things over.

For one thing, repinning is just one of a range of options for dealing with the problem of loose tuning pins. Other less drastic measures are possible. One might consider treating the pinblock, for example, with either CA glue, or one of the pin tightening products sold by Schaff. One might back the pins out and shim, using sandpaper strips. Sometimes merely pounding the pins in so that the coils are closer to the plate works wonders. Or perhaps replacing just the exceptionally loose tuning pins with oversize pins, or using pinblock plugs with new pins to replace slipping pins might do the job.

One might also consider going into a more complete repair procedure by suggesting that strings be replaced at the same time, or even the strings and the pinblock itself.

If, after exploring the options available, a replacement of the set of tuning pins with larger pins seems to be worth considering, here are some pros and cons which might help tip the scales one way or the other.

PROS

- If the piano is high in value either from a commercial or sentimental standpoint, repairs such as repinning, restringing, hammer replacement, etc. make sense and should be recommended when needed. Repinning in particular gives a high return in terms of tuning stability for the investment made.

- If loose tuning pins are the primary problem that the piano has, but the strings are in good condition, replacing the tuning pins alone is a more economical repair.

- If the customer is interested in long-term tuning stability, replacement of factory tuning pins with an oversized set of pins will provide the best performance over time, when compared with other lower-priced solutions.

CONS

- The piano should be 'worth the chips.' If it is impossible to justify the expense because of a lack of either commercial or sentimental value of the piano, that factor alone should rule out this repair.

- If the piano has a history of previous repairs, such as pin tightener treatment, over-size pins, or pins that have been pounded in, it may not be a good candidate for a new set of pins. If those efforts have been tried and have failed, it is likely that one more treatment will make little difference.

- If the piano has an issue with brittle or tubby sounding strings, repinning alone is not going to solve the string problems. With such an instrument, doing both repairs at the same time, or delaying repair work until a time a combined job is practical, would be a better solution.

Overall Recommendations:

If a lower priced repair, such as the application of CA glue, would suffice for the time being, recommending the more economical option might be in the customer's best interest.

If at all possible do not replace a set of tuning pins during a season of high humidity. Reaming out the pin holes when the wood is higher in moisture content will result in more wood being removed and thus a looser fitting set of pins when the dry season rolls around.

As always, being honest with your customers about the benefits and costs of any repair will pay off in the long run, in that customer's who have good reason to trust in your judgment and advice are more likely to seriously consider repair work that you recommend.

This particular repair does require an investment in tools and supplies which are listed at the end of the article. Once the tools have been purchased, however, further investment is limited to the sets of tuning pins to be used. The work, while not difficult, can become tedious. Count on the average job taking approximately 12 hours to complete, after you have become familiar with the routine involved.

If this job is one you haven't done before, consider acquiring an old upright to practice on before working for a paying customer.

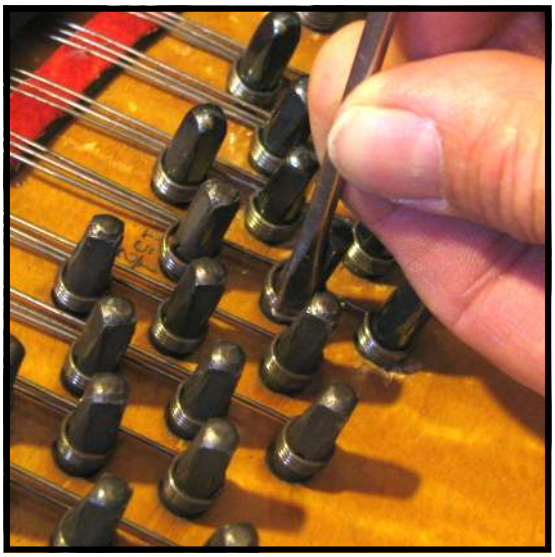
Step 1: If the piano being repinned is in a customer's home, ask permission to move furniture out of the way in order to put the piano on its back using the shop repair truck (Cat. No. 1901), which makes the work much more convenient. Before tilting the piano, remove the front case parts, action and keys and place them in a secure location. For protection of the carpet or floor, lay a blanket down covering the area under the piano. The piano will need to be an adequate distance from the wall in order to tilt it.

Step 2: Cover the areas inside the piano which will not be worked on immediately with towels or a folded blanket. Lay out tools to be used in the order that they will be picked up. By always replacing each tool in its spot, much time will be saved as the repinning progresses. Place one time use tools (such as the micrometer) back in the tool case once they are used to avoid clutter.

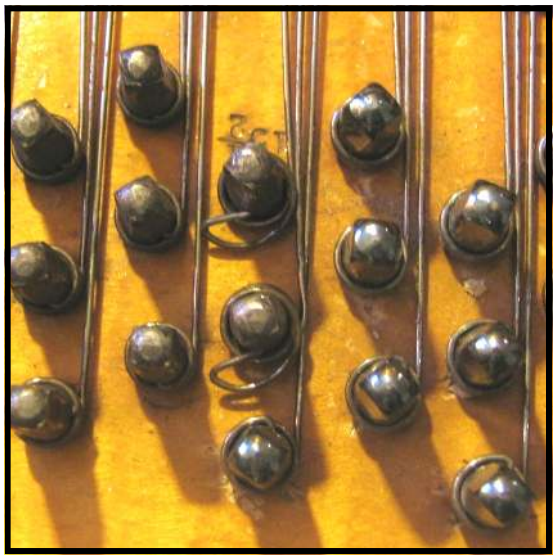
Step 3: Before removing the first tuning pin, check the hitch pins at the bottom of the piano to determine which stings are singletons with their own loops, and which strings are in pairs, going around the hitch pin from one tuning pin and back up to the next. The steps that are followed will differ slightly for strings that are singletons and strings that are in pairs. Wound strings will always be singletons, while steel string in the tenor and treble will usually be in pairs.

Step 4: Decide on a starting point, and use a nylon extension lever (Cat. No. 16), or other suitable lever, and turn the pin (for a singleton) or pins (for a pair) about 3/4 turn counterclockwise to release the tension from the string.

Step 5: Check the coils for the pins you've turned back. They should be loose enough to insert a small screwdriver in between the pins and the inside of the coil.



Step 6: Use a grand action screwdriver (Cat. No. 193), or other similar screwdriver, to remove the becket from the pins. Place the tip of the screwdriver between the coil and the pin, directly behind the becket. Use the screwdriver as a lever, with the top of the tuning pin as the fulcrum to pry the becket out of the hole in the pin. Once the end of the wire is clear of the hole, pull it slightly to the right so that it doesn't slip back into the hole as the pin is being backed out.



Step 7: Make sure the beckets are bent back and under as shown before proceeding to the next step.

Step 8: Without removing the coil from the pin, use a high-torque, variable speed drill with a power tuning pin socket (Cat. No. 63) to back out the first pin. Start slowly, and watch to make sure that the becket does not catch in the hole of the pin. If it does, stop immediately to correct the problem. Back the pin out slowly in order to prevent excessive heat build up.

At this point, if you are working on a pair of pins for one string, leave the other pin in place for the time being.

Step 8 alternative: Instead of a power drill, you may back the pins out with a hand brace, coupled to a tuning pin socket for brace (Cat. No. 25). As with the power drill, keep an eye on the coil to make sure that the becket does not slip back into the hole. If it does, and you continue to turn the pin, you will ruin the coil.

Step 9: When the pin has been turned completely out of the hole, it will usually fall from the socket when you lift the drill (or hand brace). If it does not, pull the pin from the pin socket. If the pin is still attached to the coil as shown, simply pull it free from that as well.

Step 10: Using an accurate micrometer, such as the Starrett micrometer (Cat. No. 3338) or the Starrett digital micrometer (Cat. No. 4044), measure the diameter of the tuning pin that you've just removed. If the tuning pins are the original factory pins, they are most likely size 2/0 (.282"), or size 1/0 (.276"). The piano shown in these pictures had pins that measured .264", or smaller than a size 1/0.

Go green! As you remove the original pins, toss them in a container to save for recycling. (The outside box that the new set of tuning pins were packed in works well for this.) Save the pins from each piano you restring or repin, and soon you'll have enough to take to a scrap metal redemption center.

Step 11: Decide on a pin size (diameter and length) to use, and either take those from inventory (a message about this is at the end of these instructions), or order from Schaff. Pin sizes range from 1/0 (.276" diameter) to 7/0 (.307" diameter). Most pins (except 1/0's) are available in 2-1/4", 2-3/8" and 2-1/2". All are available in blued or nickel-plated finishes. For repinning jobs, technicians generally go with either one or two sizes larger than the original, in terms of diameter. Length would usually remain the same.

Caution Ahead - Optional Procedures:

From this point on, it is important to note that technicians in the field who repin pianos as a part of their service are not in lockstep agreement as to the correct approach.

In conducting a limited survey (24 respondents + myself = 25) of technicians online (pianotech website) I discovered a couple of important areas where differences exist:

1. **Reaming holes.** Not everyone, I discovered, prepares the tuning pin holes in the same way. Of the technicians in my survey:
   - 8 reamed the holes—2 using actual reamers (explained shortly), and 6 using tuning pin drills.
   - 9 cleaned the holes, by either using either a gun barrel brush (5), vacuuming out (2), or blowing out with compressed air (2).
   - 7 did nothing to prepare holes—simply removed old pin and drove in new.
2. **Wearing gloves.** Although the majority (14) of technicians wore a glove of some sort while working on a repinning (a golf glove, or light cotton work gloves were mentioned the most often), there were enough who didn't (11, including myself) that it seems to be an acceptable practice. Several who didn't wear gloves reported having dry hands—therefore less of a need. A few of the technicians reported using either baby powder, or talcum powder (both with and without gloves), to keep moisture away.

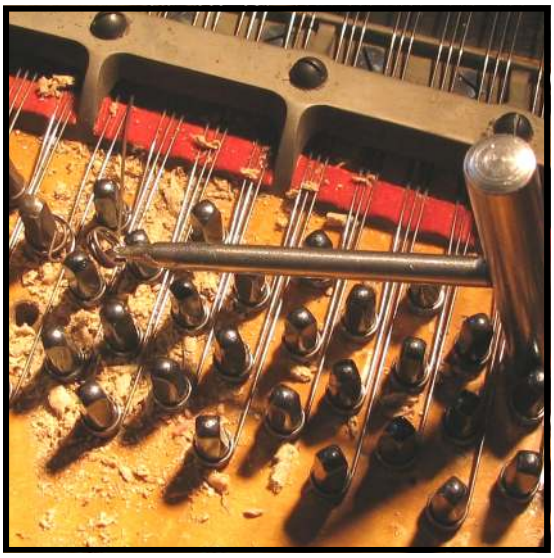
If nothing else, the survey showed what I already sensed—that not everyone who repins does everything the same way. (In fact, for the 6 questions I asked in the survey, there were no two technicians who answered every one of the questions in exactly the same way!)

Please keep in mind that what follows is a description of the procedures I myself use, but that there are other techniques out there that should be considered. For newcomers to the field, I would recommend not relying on any one set of instructions, but doing other research and talking to other technicians. **Most importantly, join the Piano Technicians Guild, where you will find members with decades of experience who are more than willing to share their knowledge.**

Step 12: If you decide to ream the tuning pin holes before driving in the new pins, select the corresponding tuning pin drill (Cat. No. 136), or tuning pin reamer (Cat. No. 137) to go with the pin size selected. (My thinking is that either way, it is important to clean the hole out with a fresh cut of wood at the proper size. Pounding oversize pins into the original hole without reaming may lead to overly -tight, jumpy pins, and could cause splits in the block. But again, there are technicians who would disagree.)

Step 13: Before reaming the hole, make sure the coil is pulled to one side to avoid nicking the string on the side of the drill bit. (If you wish to wear a gloves, now is the time to put them on. If you are prone to perspiration, consider using baby powder to keep the moisture away.)

If instead of reaming, you intend to clean the pin holes, try using a .306 gun barrel cleaning brush at this point with an up and down motion. Vacuum up any debris.



Step 14: If the coil does not stay put out of the way by itself, use a stringing hook, (Cat. No. 135S), to hook the coil and pull it over to the side. It should be possible to secure the handle of the stringing hook against a tuning pin, as shown, to free both hands for using the drill.

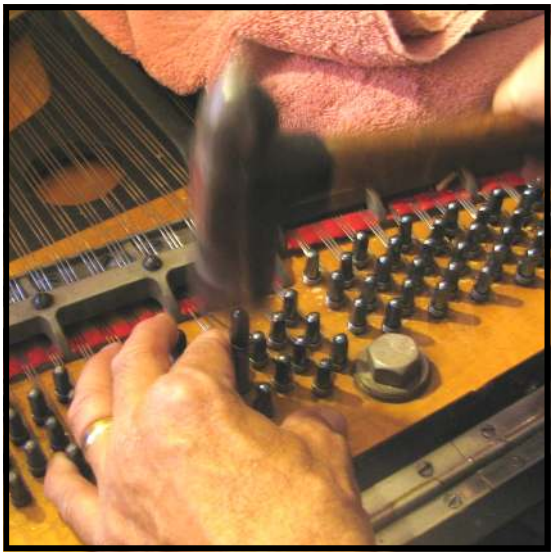
Step 15: With a quick motion down and back up, and the drill turning at high speed, ream the hole for the new larger pin. Wood chips should fly out as the bit is brought back up. If there is any smoke, your bit is dull, and should be sharpened or replaced.

Although the drill bit will follow the direction of the hole, be sure to have the correct slant to begin with. Observe the slant (generally 7 degrees back from the perpendicular) of the original pins, and match that.

Step 16: Taking a new pin from the box, hold the pin in your left hand, while working the coil over the top of the pin with your right. By using a pair of long needle nose pliers (Cat. No.234) as shown, you can lift the sharp end of the becket enough to avoid scratching the side of the pin as you slide the coil down to the hole in the pin. Keeping a firm grip on the pliers, turn the becket into the hole in the same motion.

Step 17: Trade the needle nose pliers for a regular pair of pliers, and crimp the becket down closer to the pin.

Step 18: With the coil on the tuning pin and the becket in the hole, insert the end of the pin into the waiting hole in the pinblock and angle it forward. The coil will unwind slightly as the pin is brought to a vertical position.



Step 19: Holding the tuning pin in place with your left hand, give the top of the pin two or three solid taps to start it with a ball peen hammer (Cat No. MF-1916). The pin should be driven in far enough to remain in place when released.

Step 20: Line up a pin punch (Cat. No. 174 [3”], 174A [5”] or 174B [4-3/8”]) to be in line with the pins. Be aware of the backward slant of the pins. Again, match the slant of the pins when preparing to drive the new tuning pin in place.

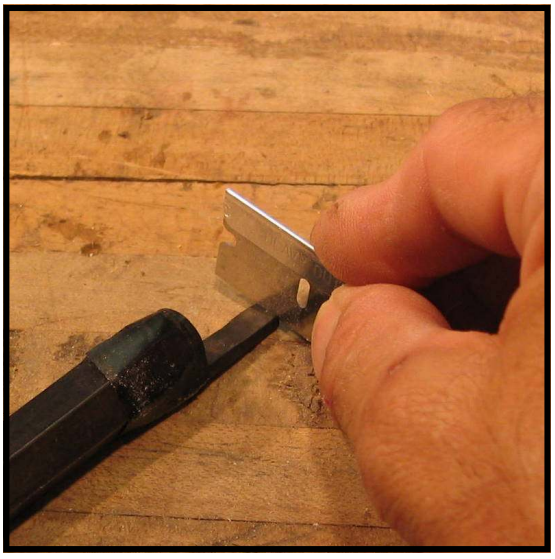
Hazard!!! If you are given or inherit a pin punch such as this one, do not use without grinding the top down smooth! Using a worn tool such as this could cause injury, as pieces could break off upon impact!

Step 21: A depth gauge on the end of the pin punch, such as this sliver of a rubber mute (Cat. No. 205) taped to the body of the punch, will help you drive the tuning pins to a consistent height. With an eye on the depth gauge, pound the pin into place. Correctly done, this step should take 6-8 blows of the hammer. When the rubber sliver of mute touches the plate, stop. *(The basics of correctly setting correct pin height using a depth gauge are to follow.)*

Steps to setting pin height gauge:

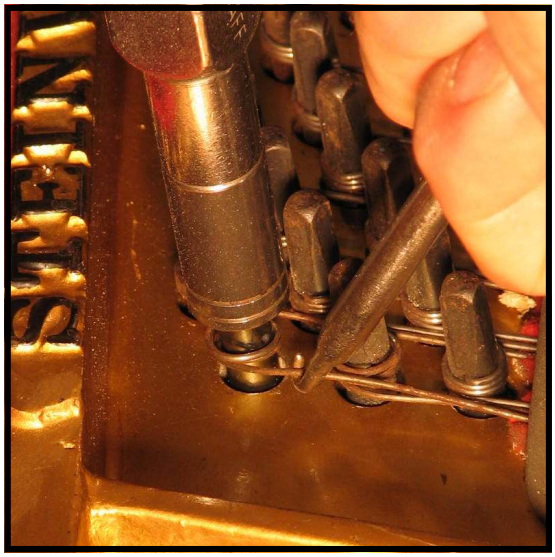
First—Find an existing pin in the section you are about to work on which has the standard distance from the bottom of the coil to the plate of approximately 3/16ths of an inch.

Second—With your pin punch outfitted with a sliver of rubber mute (electrical tape wrapped several times around the mute and the body of the punch will hold it securely in place), check in the piano for length. Place the punch firmly against the head of the pin. The end of the mute should just make contact with the plate. If it bows outward at all, it is too long.

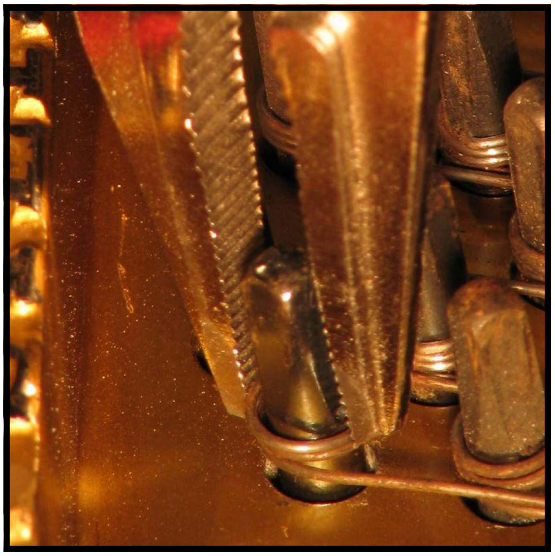


Third—Shorten the gauge if necessary by slicing off the tip of the mute with a sharp razor. Go easy—if you slice off too much you will need to unwrap the tape and start over with a new piece.

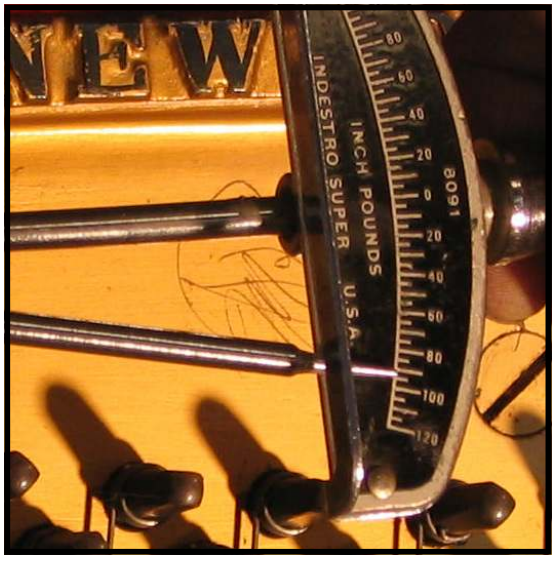
(Some technicians use a hammer shank or other device to accomplish the same goal. Experiment, and see what works the best for you.)



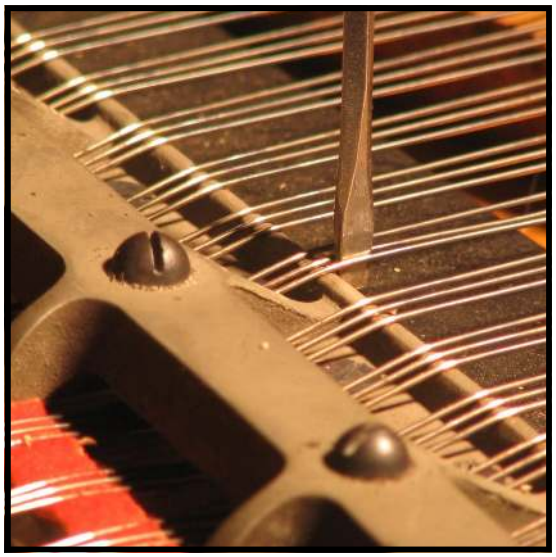
Step 22: With the tuning lever and the string hook, put just enough tension on the first string to take up the slack in the coil. By pulling upward on the string hook as you turn the pin clockwise, you will begin to tighten up the windings of the coil.



Step 23: Re-crimp the becket, using a pair of long nose vise grips (Cat. No. 271). This step may need to be repeated one more time, once the final adjustment to the strings have been made.



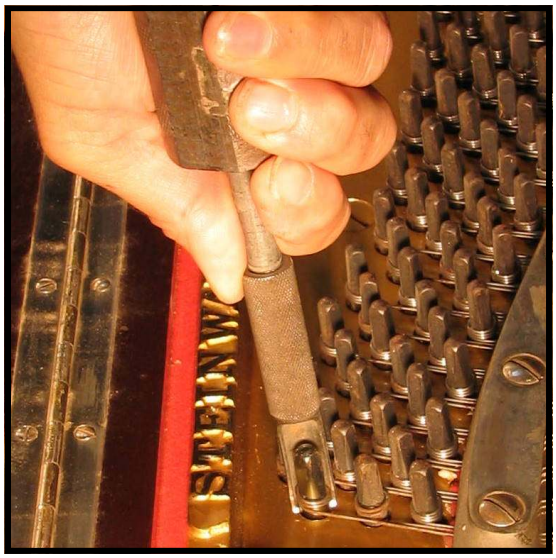
Step 24: At this point, use a torque wrench (Cat. No. 6010) to check the tightness of the first pin. A torque of at least 120 inch pounds, combined with a smooth feel as you turn the pin, is desirable. (This step does not need to be repeated, unless there is cause for doubt as to the tightness of the new pins.) *If the pin removed was one of a pair of pins, return at this point to step 8 and remove and replace the other pin. If the pin was for a string that is a singleton, continue with the following steps.*



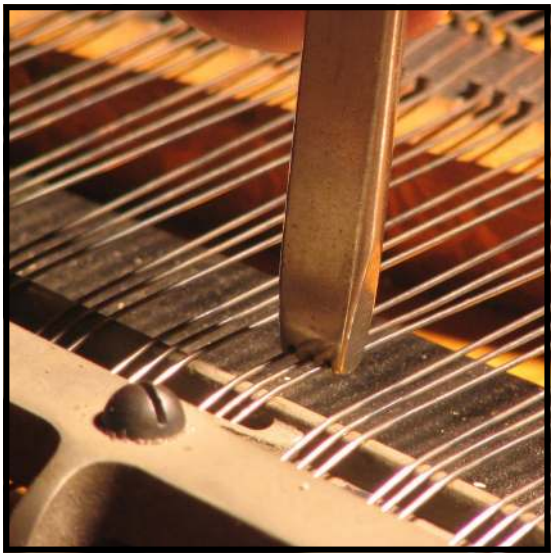
Step 25: Before putting any more tension on the strings, check to make sure that spacing is approximately even. Small adjustments may be easily made at this point using either a grand action screwdriver, or a jeweler's screwdriver (Cat. No. 3275). To widen the spacing, insert the blade between the two strings and turn the blade slightly. Be sure to check the spacing both before and after the string runs over the pressure points. Fine adjustment of spacing will be made after the strings are up to tension.

Step 26: With your thumbnail, pluck the two strings to ascertain pitch, and also the string for the note that has not had its tension dropped. If the string is a pair that goes from one note to the next, check the pitch of both notes involved.

Starting with whichever string is lower in tension, stairstep the tension up chromatically towards correct pitch (or pitches). Work back and forth between the two pins, never allowing the difference in tension to be much more than a half of a step.



Step 27: Check the tightness of the coil. If the strings of the coil are not firmly compressed together, you may tighten them by using an impact coil tightener (Cat. No. 3101). Slip the bottom ridge of the tip under the coil, then slide the weight upward to tighten the windings.



Step 28: Make fine adjustment to the string spacing using a string spacer (Cat. No. 133). Place the slots of the spacer over the 3 strings for the note. When the spacer is pulled off the strings, it should be quiet. If you hear a 'zing,' the strings are not evenly spaced. Adjust and re-check until the spacer may be placed on the strings and removed without causing the strings to vibrate. Be sure to use the spacer at the same point in the speaking length of the strings for every note.

Step 29: Once the treble section has been completed, turn your attention to the bass. The wound strings of the bass will all be individual strings—each with its own hitch pin. Remove one pin at a time as you move from the break towards A0. Make sure that when you release the tension on each string, that it stays in place on the bridge and hitch pins.

Step 30: After the coil has been put on the new pin, twist the pin in the direction of the winding one turn. Put the pin in the hole, and drive into place. Follow all the steps as before. With strings that are two to a note, bring the pitch up to match the other string. For the lowest notes, with one string to a note, set the pitch by going between the notes on either side.

Step 31: With all the pins replaced, double check everything before returning the action and keys to the piano. In particular, check to make sure that the strings are correctly aligned over the bridges. Re-check the string spacing. Re-crimp any beckets that don't seem tight and check the coils to make sure the windings are snug.

With everything double-checked, vacuum out all the wood chips from drilling and put the piano back together.

Voila! Ready to tune.

Suggestions for Building Inventory:

Running a successful piano restoration shop requires an outlay of both time and finances. Running a business on a shoestring does not inspire confidence in the customer who visits the shop to make a decision about a restoration proposal. Having a shop that is well outfitted in both tools and supplies show that you are serious about your work, and will generate business as customers see that you intend to do the job right.

To painlessly build inventory of both tools and supplies over time, so that your shop looks like an actual business of a serious and professional nature, and not just a hobby, I suggest taking each check written to you for restoration work, and putting a set percentage back into the shop in equipment, tools, and supplies. Having inventory on hand not only adds a professional appearance to your business, but makes work flow more smoothly, in that you are not always waiting for the UPS truck to deliver the supplies that you need to continue with a job.

Never be afraid to invest in your business!

Chuck Behm

Tools and Supplies

For your convenience, all the tools and supplies necessary to complete this repair are listed with corresponding catalogue number.

Important note: Ordering information is given for the use of Schaff account holders only.

Tools:

Shop repair truck.....Cat. No. 1901
Nylon extension lever.....Cat. No. 16
Grand action screwdriver.....Cat. No. 193
Power tuning pin socket.....Cat. No. 63
Tuning pin socket for brace.....Cat. No. 25
Starrett micrometer.....Cat. No. 3338
Starrett digital micrometer (optional).....Cat. No. 4044
Tuning pin drills.....Cat. No. 136
Tuning pin reamers (optional).....Cat. No. 137
String hook.....Cat. No. 135S
Long needle nose pliers.....Cat. No. 234
Ball peen hammer.....Cat. No. MF 1916
Pin punch.....Cat. No. 174 A & B
Rubber mute.....Cat. No. 205
Long nose vise grips.....Cat. No. 271
Jeweler's screwdriver.....Cat. No. 3275
Torque wrench.....Cat. No. 6010
String spacer.....Cat. No. 133
Impact coil tightener.....Cat. No. 3101

Supplies:

Nippon Denro tuning pins.....specify size needed

To order, call Schaff Piano Supply at 1-800-747-4266

Notes on Procedures