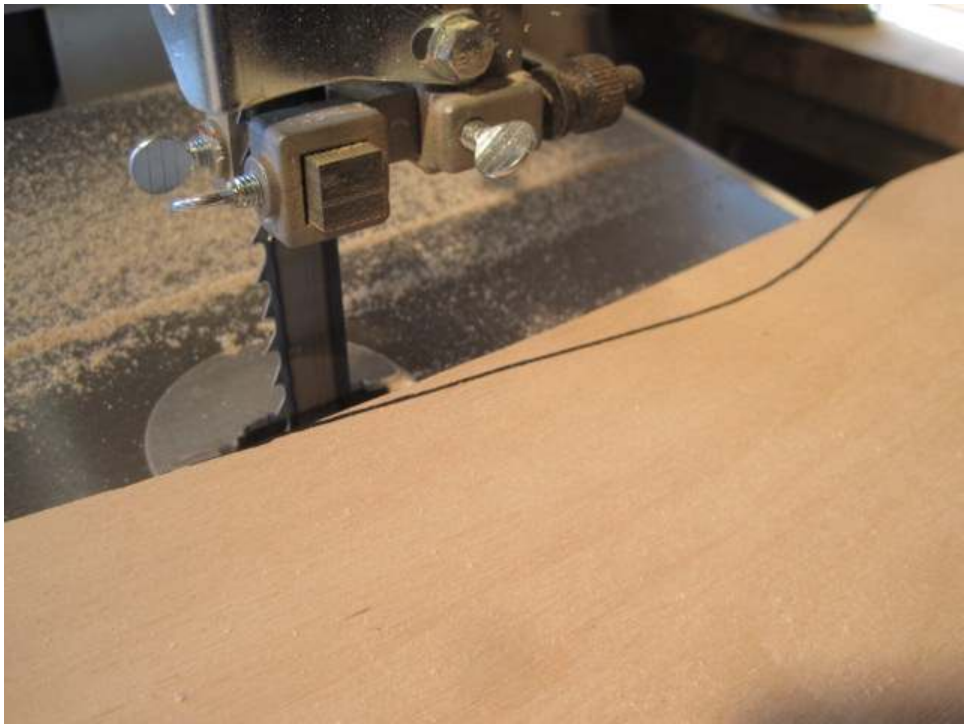

Photo 50: The cut is nearly completed, except for the inside turn in between the bass section and the tenor section. The ¾" blade I use on the overall cut is too wide for this.

Photo 51: A ¼" blade is substituted. The wider blade gives a steadier cut on the overall line, and so it's worth the time to make the switch to get the best of both blades.

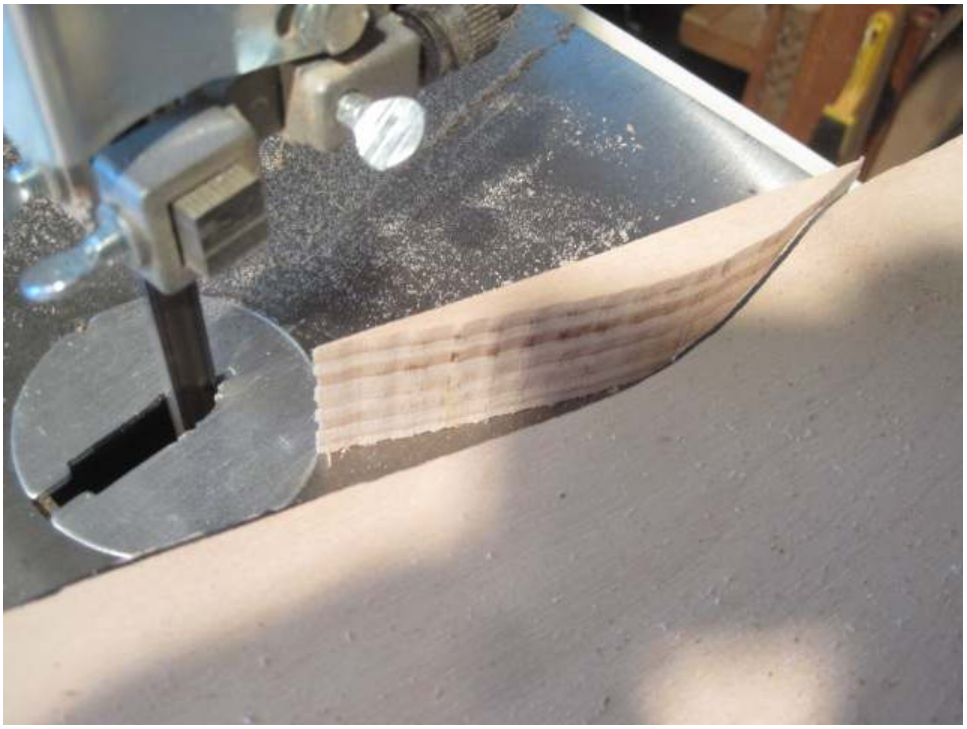

Photo 52: With the narrow blade, the cut is easily finished.

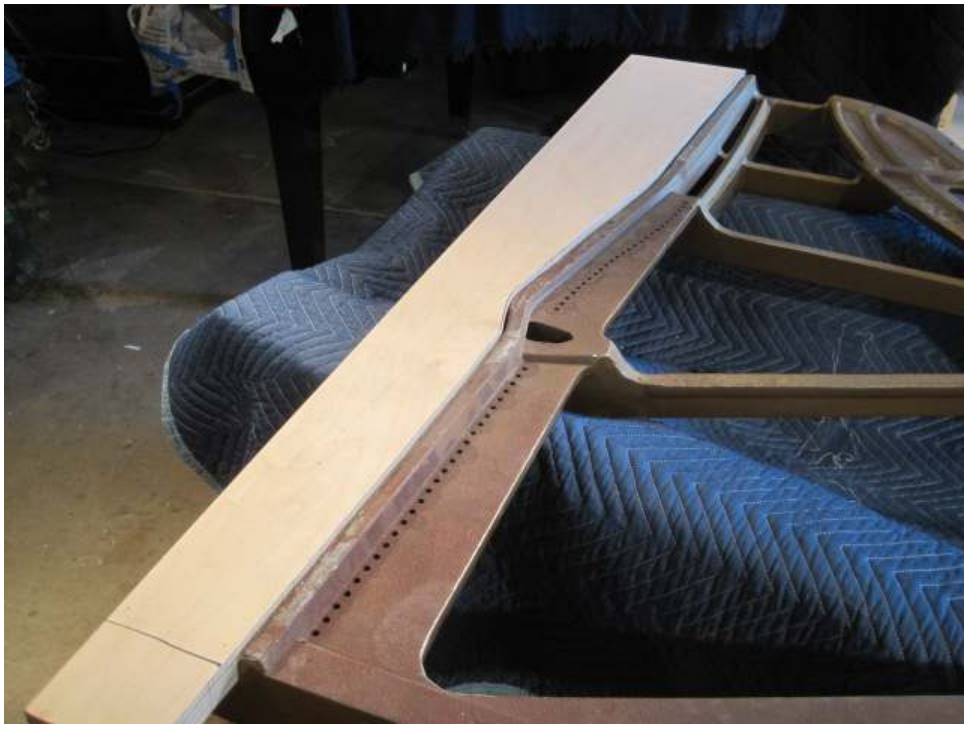

Photo 53: The rough cut pinblock is put in place on the cast iron plate. A lot of work remains before it comes close to being fitted.

Photo 54: The pinblock should butt up firmly against the corresponding flange on the underside of the plate. With a good fitting job, the wood / cast iron connection will be snug from one end of the pinblock to the other. An absolutely tight fit will dramatically affect the stability of the tuning, as the strings, when brought up to tension, exert approximately 20 tons of tension pulling the pins, and the pinblock, backwards towards the rear of the piano.

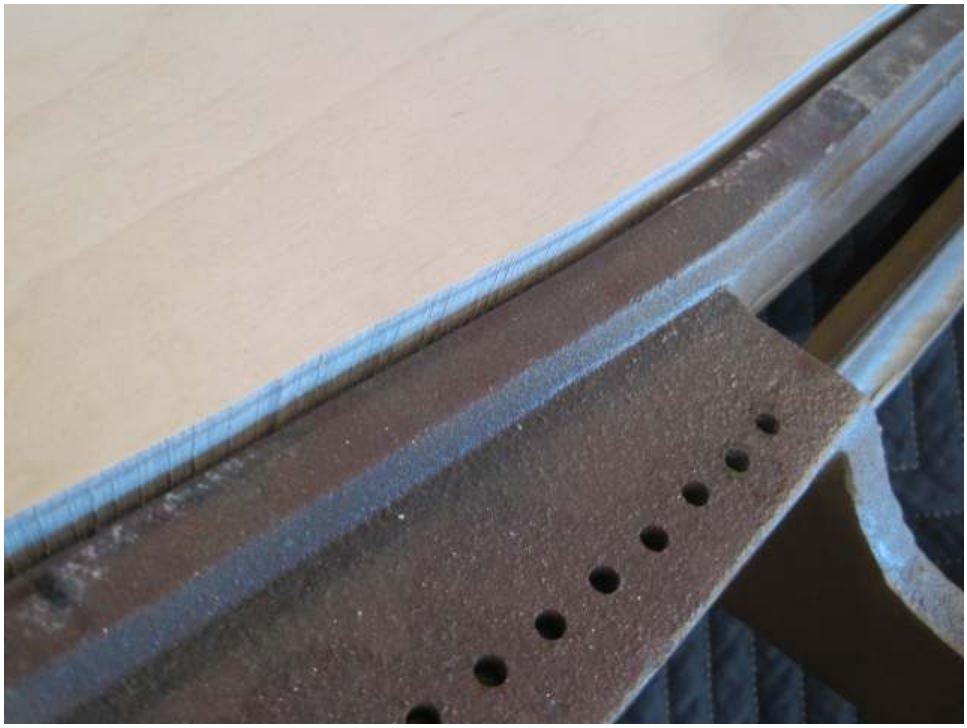

Photo 55: Out of the gate, there are plenty of gaps. With the irregular contour of the cast iron flange, this is about par for the course when using a band saw to make the cut. The factory can do better on the first pass, taking advantage of computer operated, highly specialize cutting equipment.

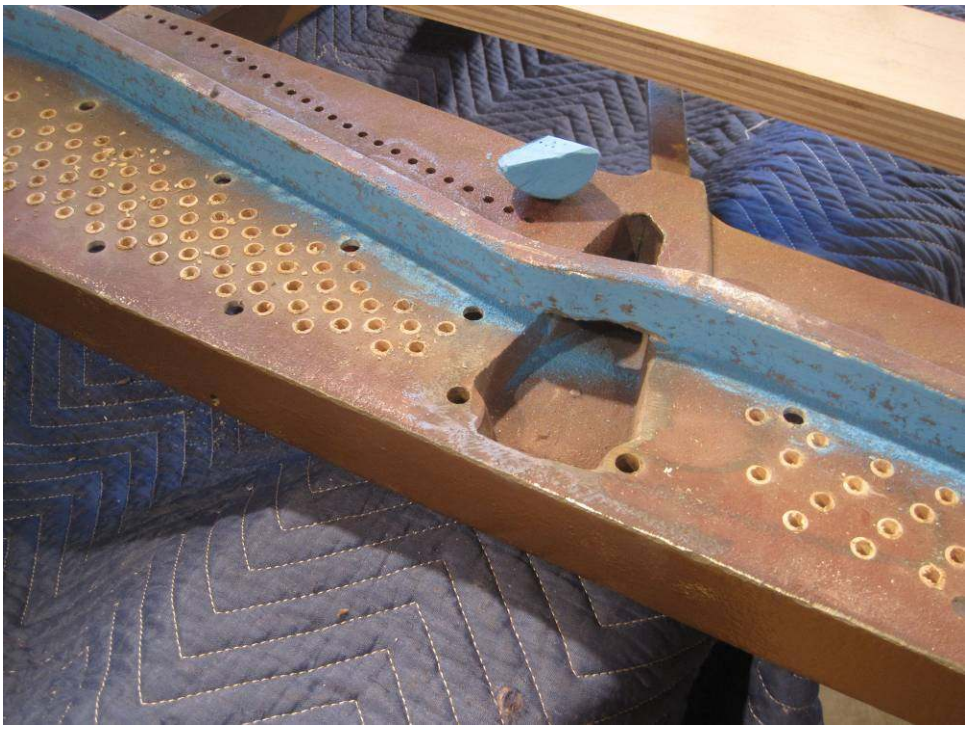

Photo 56: Not having an industrial grade Plasma CNC cutting machine at my disposal, I'll be fitting the pinblock the old fashion way. The first step is to chalk up the flange.

Photo 57: Placing the pinblock back on the plate, I knock it in several places with a heavy rubber mallet. This will show me the high spots, where wood is touching metal.

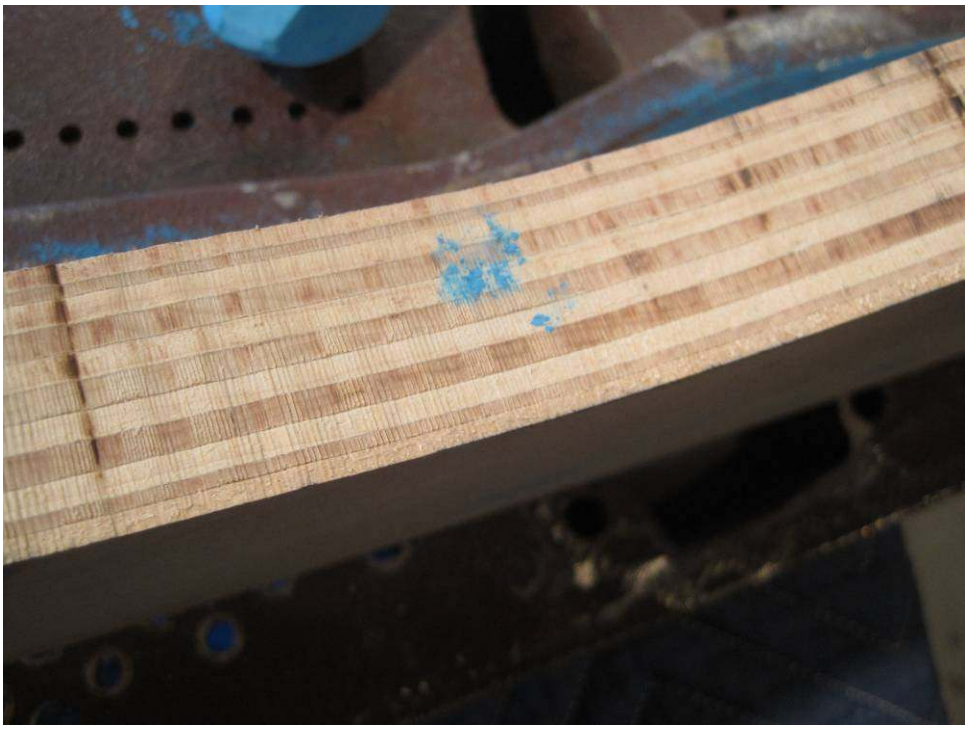

Photo 58: Three chalk spots show that little actual contact is being made.

Photo 59: I next carry the pinblock to another room of the shop (not enough free space here for the cast iron plate, unfortunately), where a special bench with a pair of vise is used to steady the work piece.

Photo 60: Using a grinding drum mounted on a heavy-duty drill, the chalked spots are ground down. The process, once begun, repeats itself over and over.

Photo 61: After a dozen or so trips back and forth, progress is being made. The idea is to have continuous chalk spots showing up from one end of the pinblock to the other.

Photo 62: After 78 trips back and forth (anywhere between 50 and 100 is typical), the pinblock passes the "business card" test. A business card, placed anywhere along the pinblock between the wood and the metal flange, will be grabbed tightly when the pinblock is pressed forward.

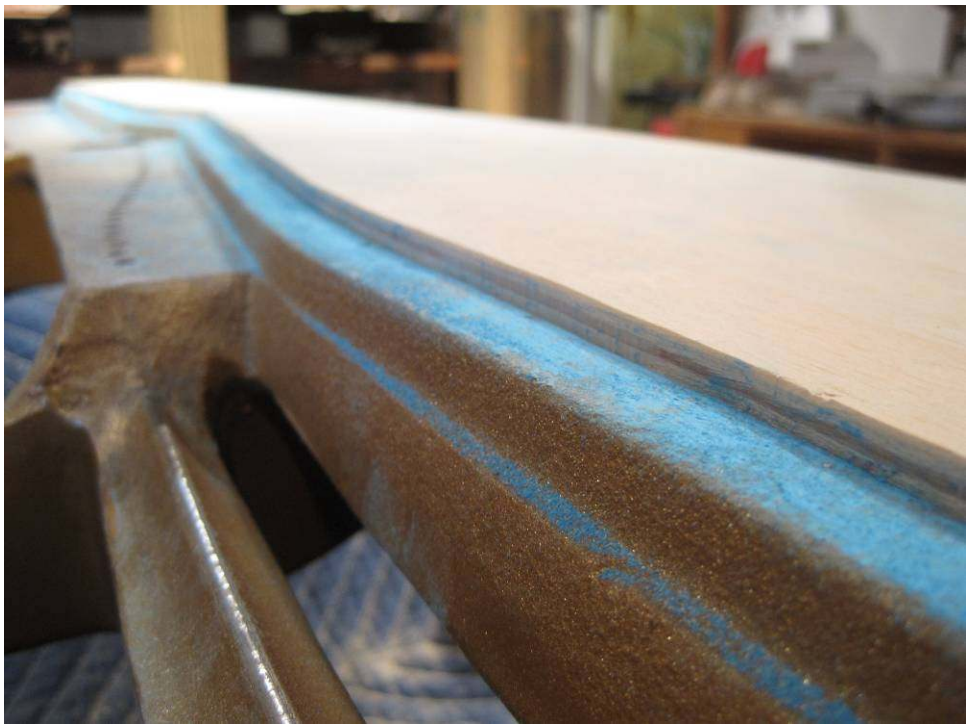

Photo 63: A tight fit from end to end..

Photo 64: Before flipping the plate, the pinblock is clamped into place for the purpose of marking the holes for the plate screws.

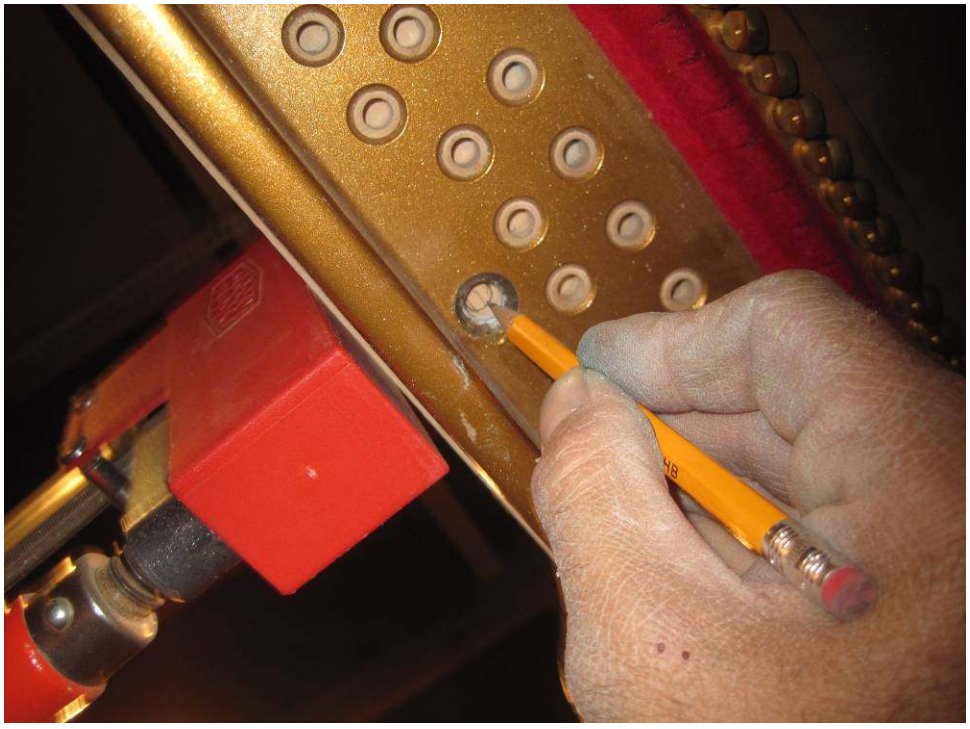

Photo 65: Looking up from underneath, I mark the screw holes, but <u>not</u> the tuning pin holes.

Photo 66: Several of the screw holes are drilled, so that the pinblock may be positioned securely to the plate before the pinblock holes are drilled.

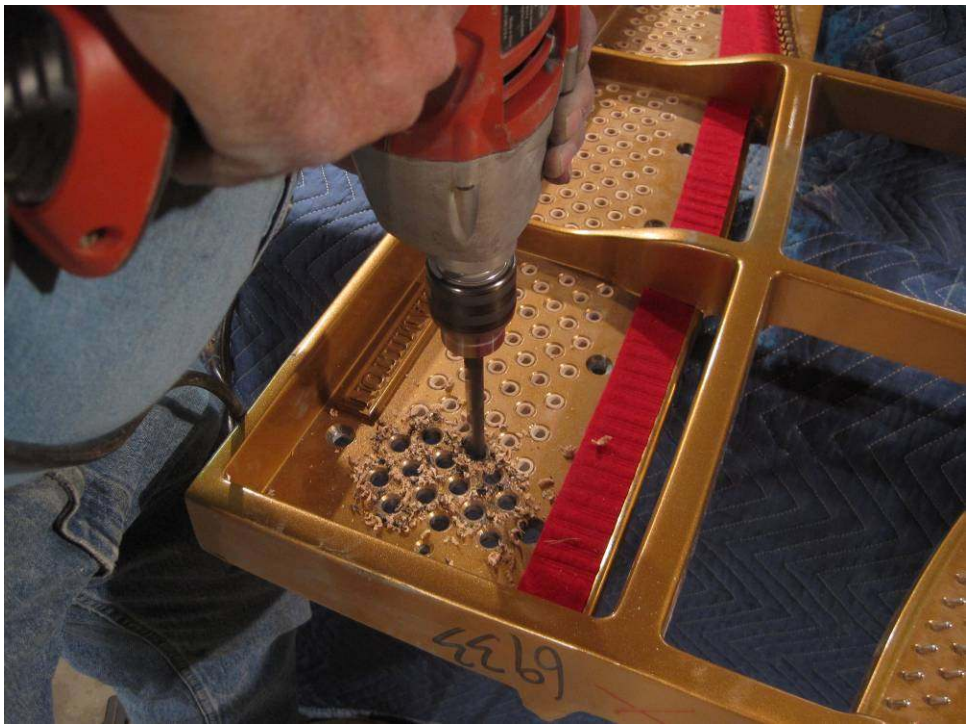

Photo 67: The plate is now turned right side up. Before marking the tuning pin holes, however, the original tuning pin bushings must be removed. Ordinarily, these are punched out, but for some reason the factory glued these bushings in place, so they must be drilled out.

Photo 68: A section of plate with bushings.

Photo 69: A section with the bushings removed.

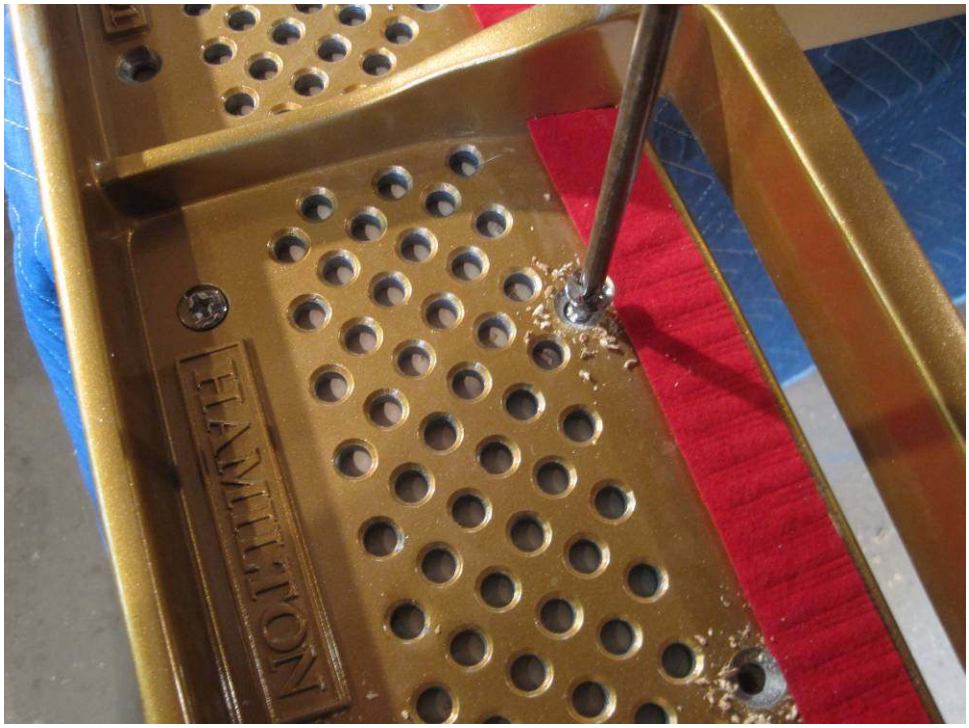

Photo 70: Screws on either end of the plate and in the center are tightly screwed down.

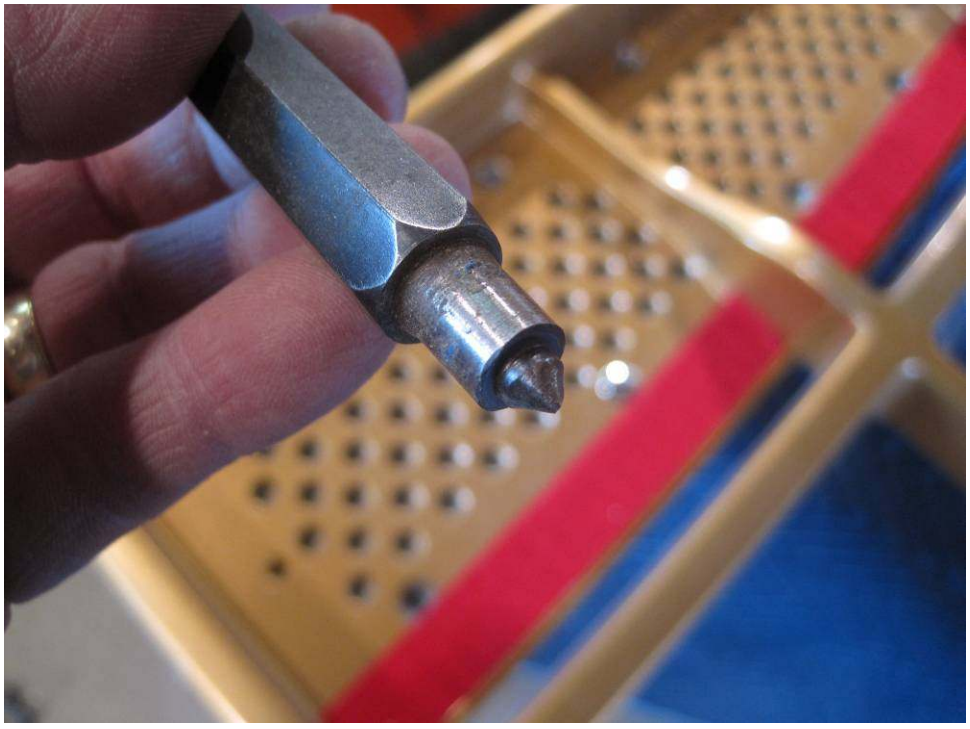

Photo 71: The specialized plate punch used to mark the center of the tuning pin holes.

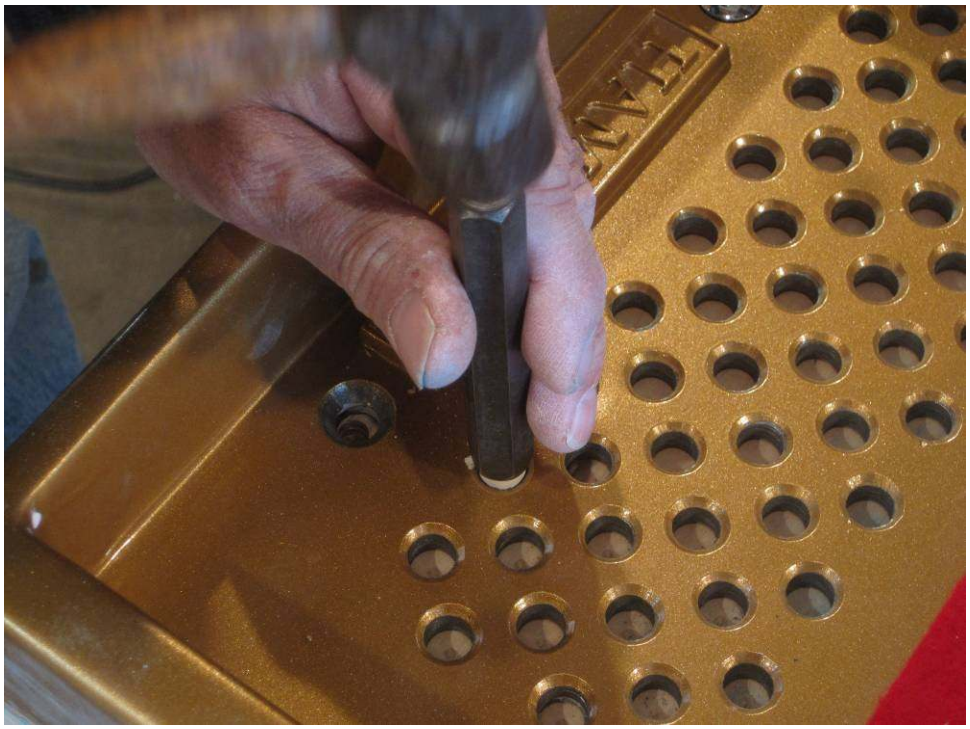

Photo 72: Each hole is punched.

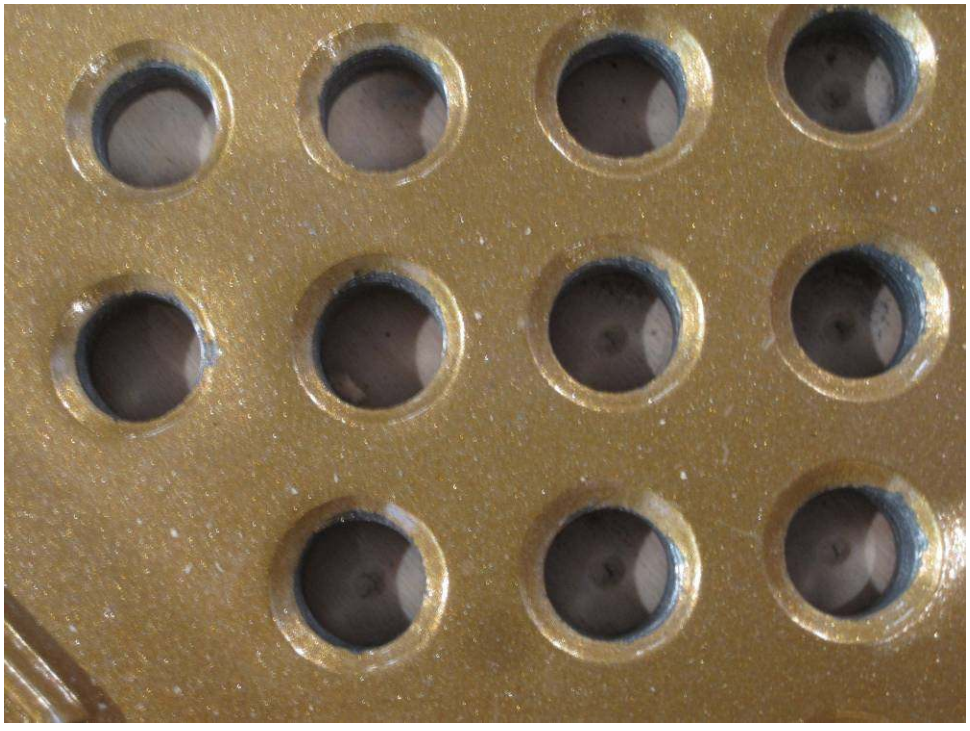

Photo 73: This is a quick and accurate way to mark all the holes.

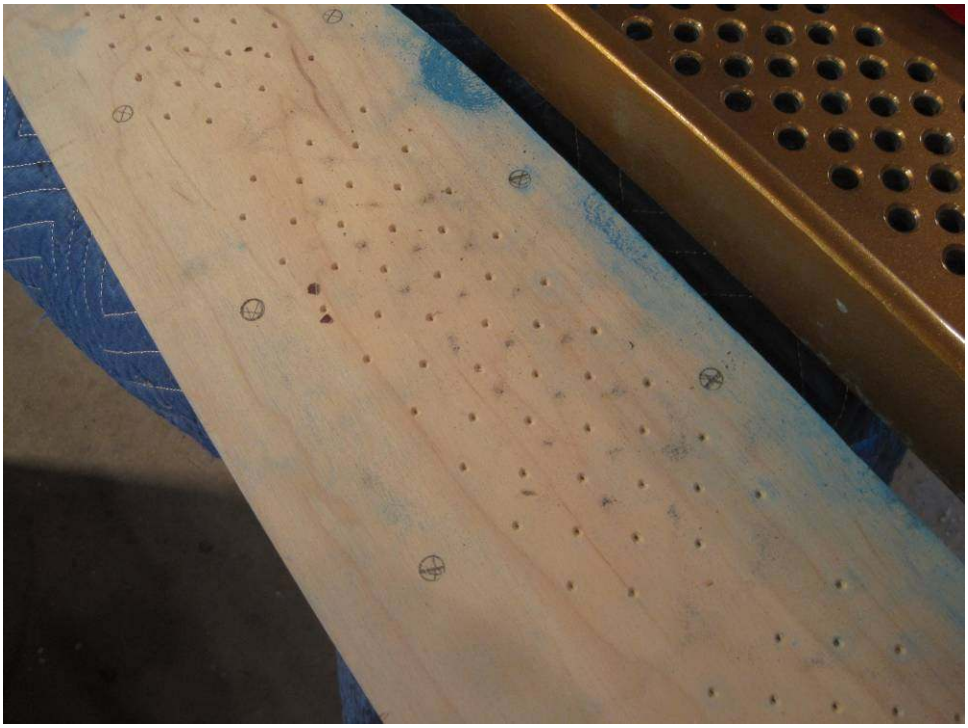

Photo 74: Once the tuning pin holes, and the rest of the plate screw holes are marked, the pinblock is removed from the plate for drilling.

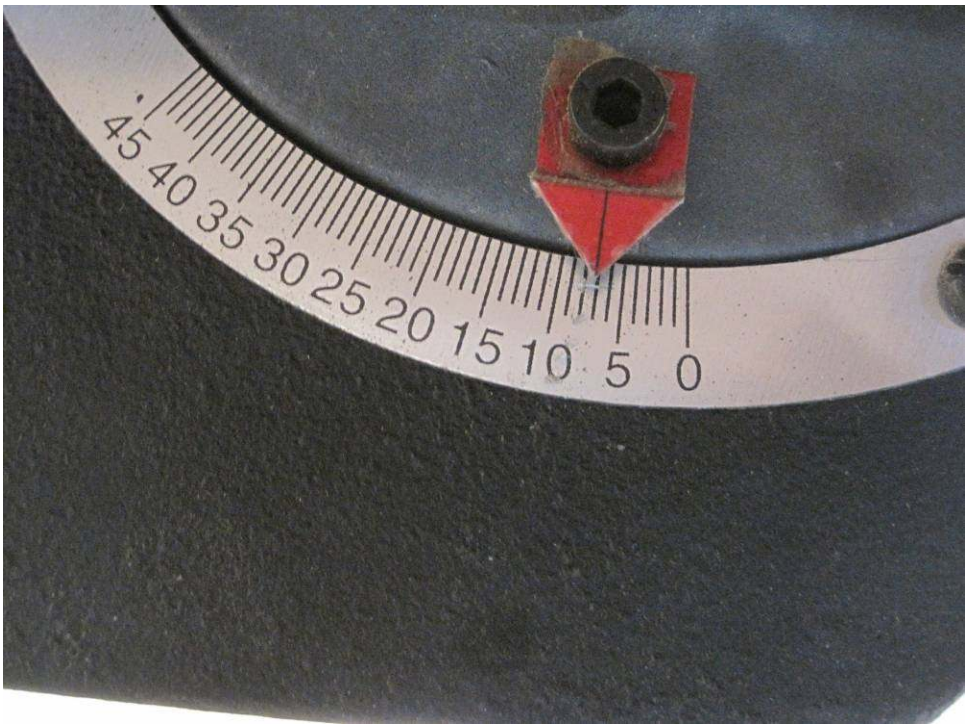

Photo 75: The drill press bed is set at 7 degrees of slant. The tuning pin holes are drilled at this angle so that the pins slant away from the strings, somewhat like the stakes holding a tent are driven in at a slight angle away from the tent.

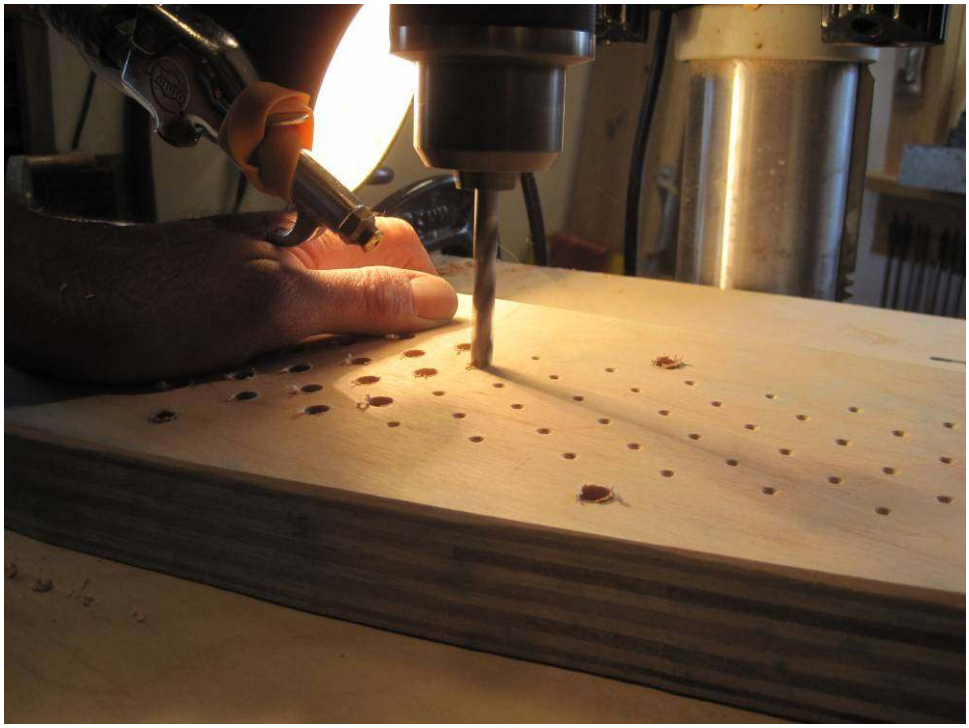

Photo 76: A constant air stream helps keep the high speed .269" drill cool. The holes are drilled at a rate of one every 15 seconds. With a sharp drill and the air stream, the drill bit will only be slightly warm to the touch after drilling approximately 230 holes in 1 ¼" thick hard rock maple.

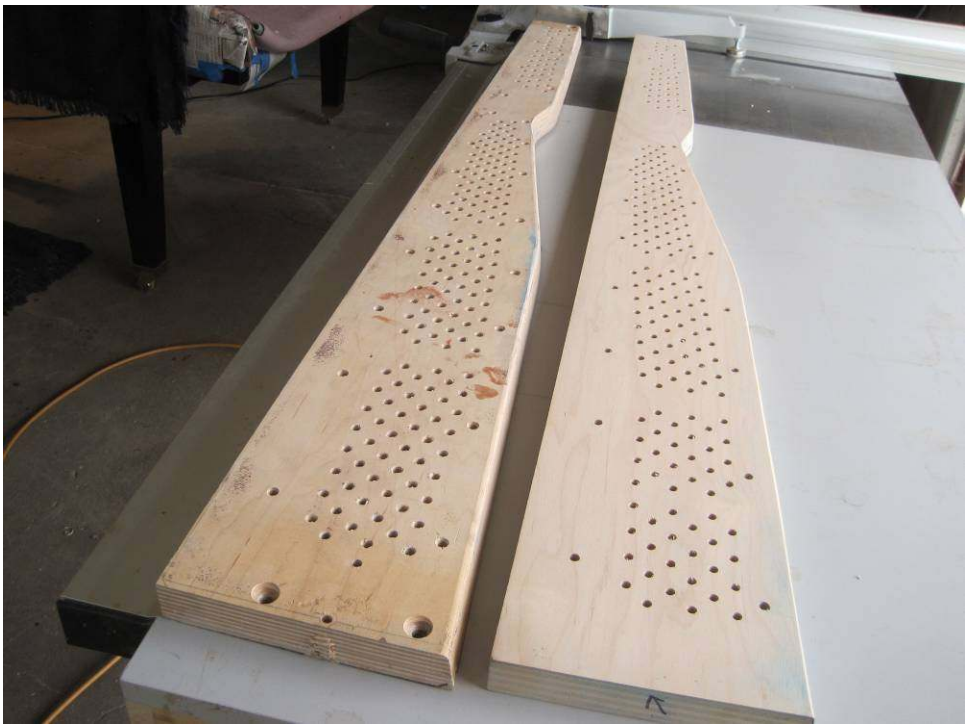

Photo 77: The newly drilled pinblock side by side with the old block. The large countersunk screw holes on either end will be drilled once the pinblock is glued to the ledges inside the rim.

Photo 78: With the pinblock again temporarily screwed to the plate, the pin holes line up perfectly. The appearance of off-center screws is an illusion caused by the position of the camera relative to each hole.

Photo 79: The plate with attached pinblock is carefully lowered for the first of several times into the piano. The dowels line up the screw holes in the plate with the hole along the outer edge of the soundboard. The helps the plate smoothly lower into position without making unwanted contact with the inner rim.

Photo 80: Once the exact positioning of the pinblock and plate are determined, matching lines are drawn where the underside of the pinblock rests on the ledges inside of the rim.

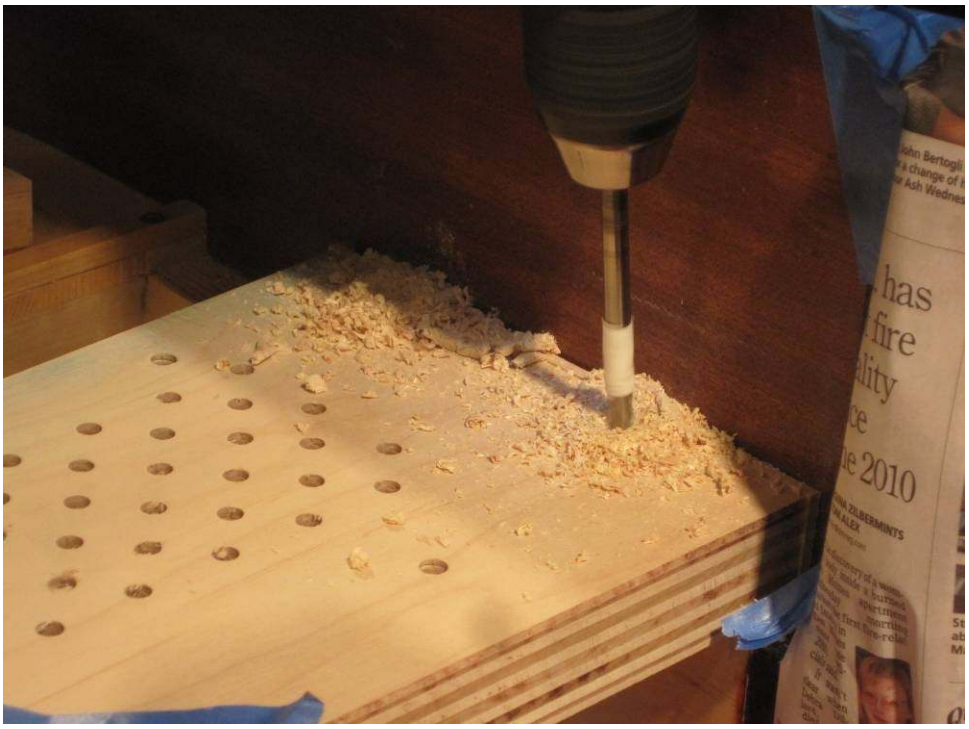

Photo 81: Once the position is set, the plate is removed, and the pinblock is glued into place. After the glue joint is solid, new screw holes are drilled.

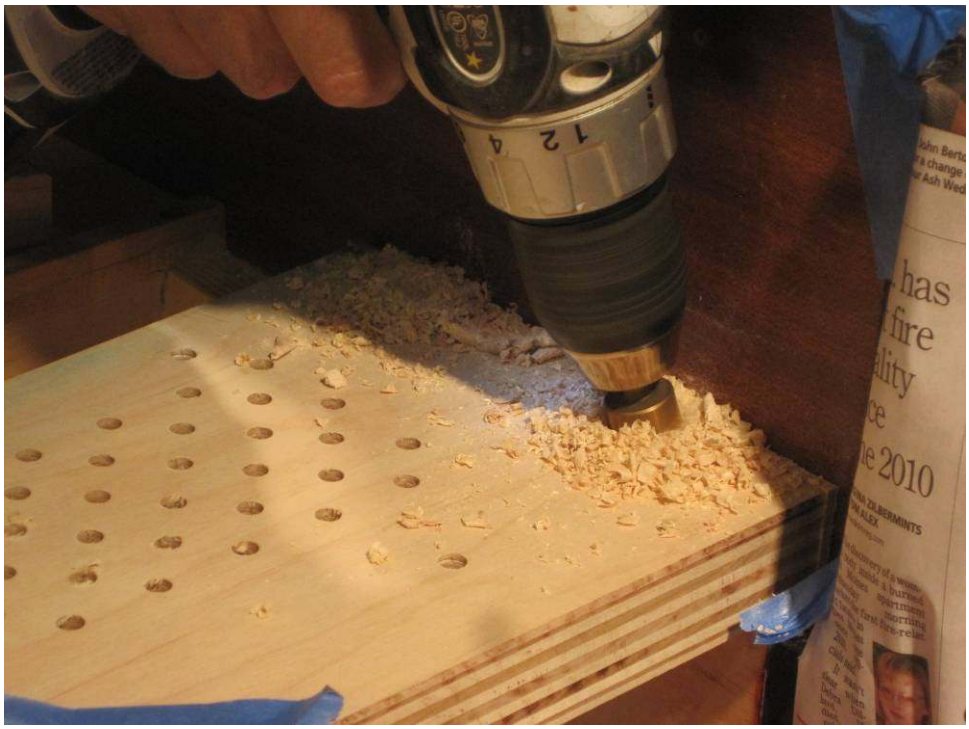

Photo 82: The screw holes are countersunk.

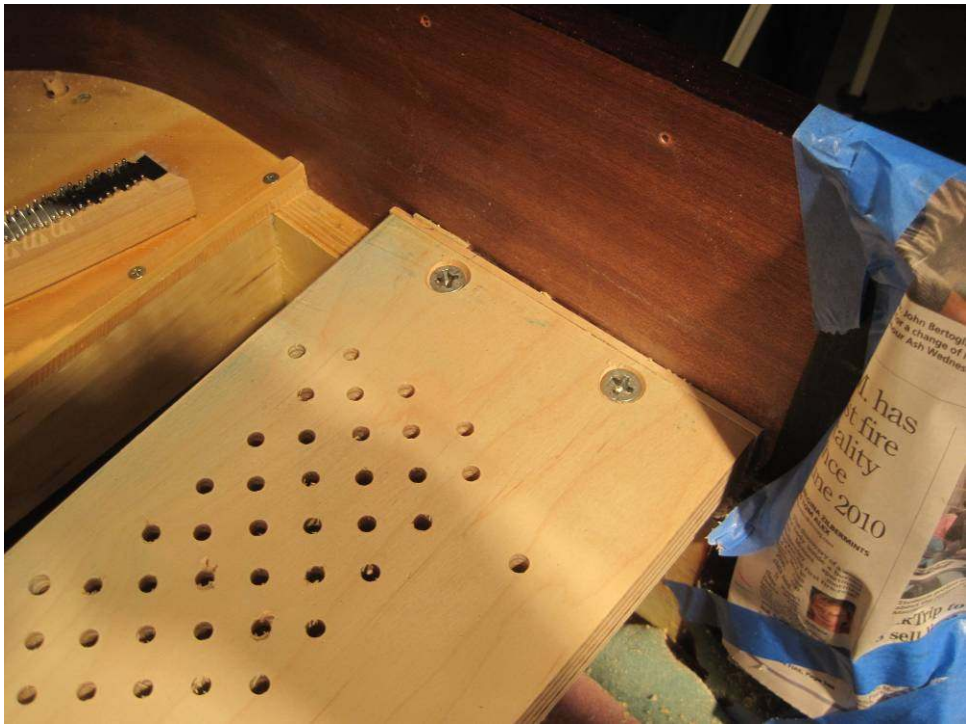

Photo 83: The pinblock glued and screwed into place. The block was deliberately cut 1/8 short on either end to allow for lowering the plate with attached pinblock smoothly into the piano. The original pinblock fit so tightly it had to be knocked out of place with a mallet. Because of the fact that I drill the block on the drill press, and not after it's installed in the piano (as the factory does), adequate clearance needs to be allowed to be able to raise and lower the plate and block with the hoist without it binding. Therefore the necessity for the shims to fill the gap.

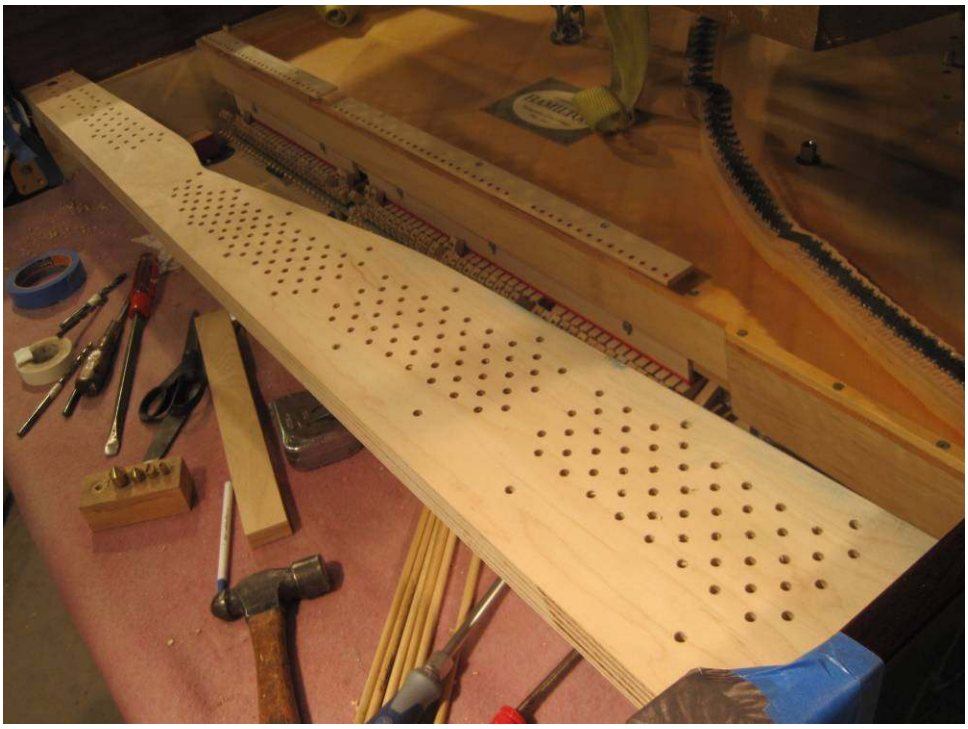

Photo 84: The piano with installed pinblock, ready for the putting the plate back into place for the final time.

Photo 85: With the pinblock in the piano this time, the plate is carefully lowered down one last time. If everything was done correctly, all screw holes and pin holes should line up exactly.

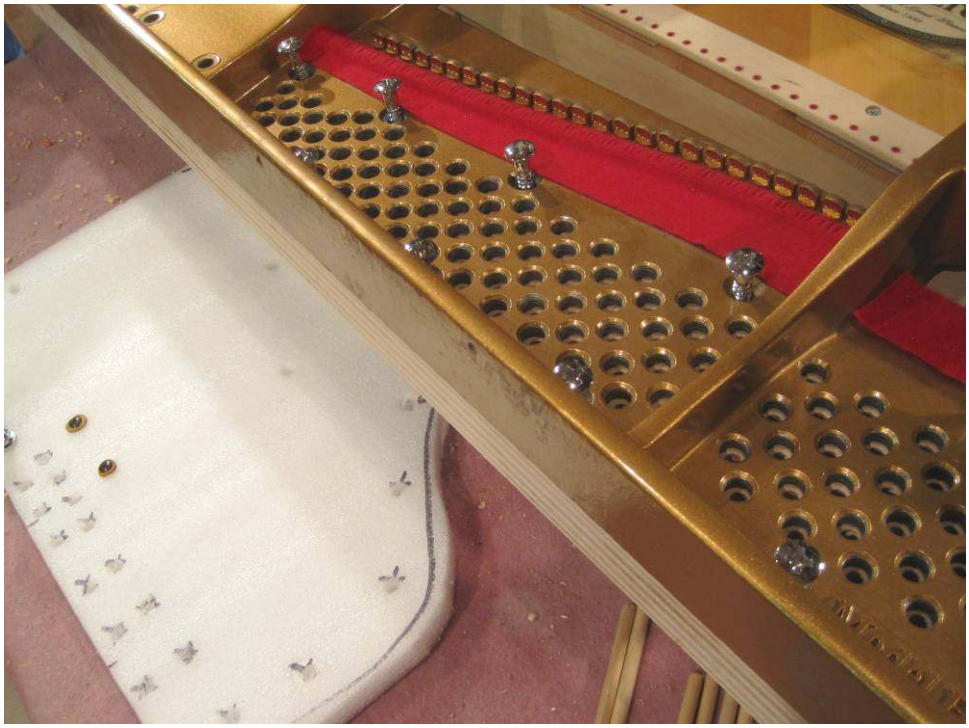

Photo 86: Screws are taken from the foam board where they have been stored, and put back into the correct holes and turned down.

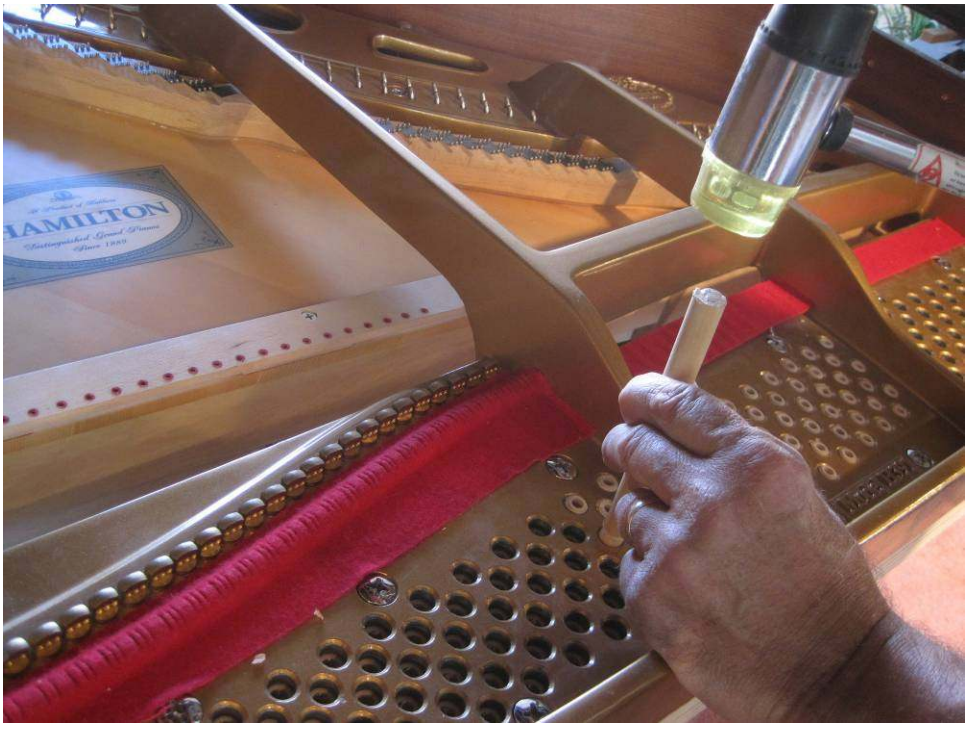

Photo 87: New tuning pin bushings are pounded into place.

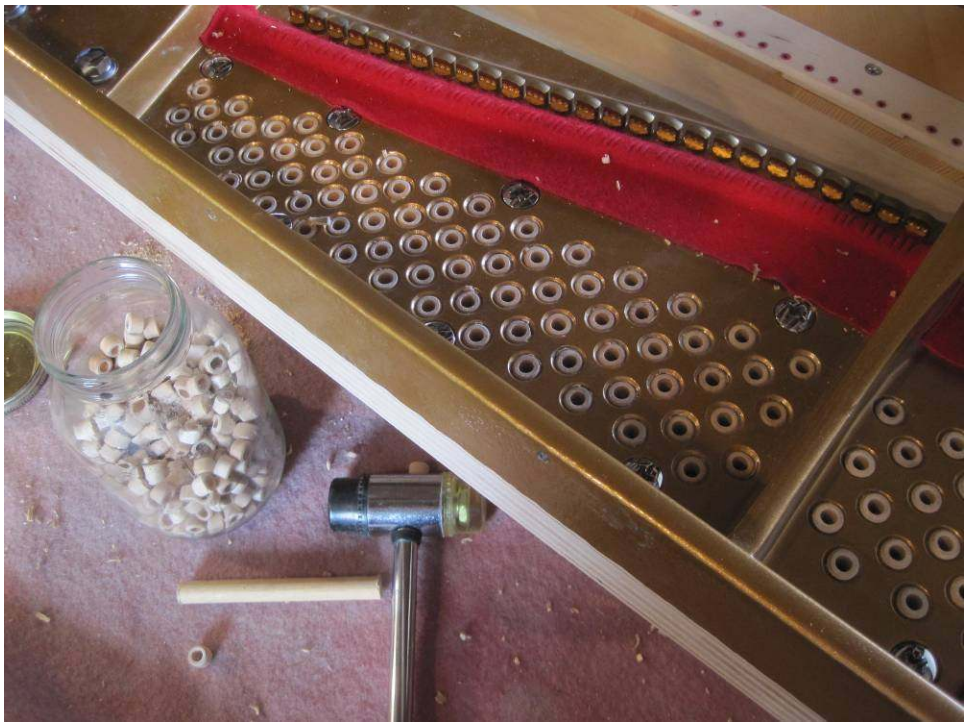

Photo 88: Bushings in place. The center holes for the pin are intentionally too small. If the holes were drilled at the size needed for the pins, the bushing would be too thin and fragile to pound into place.

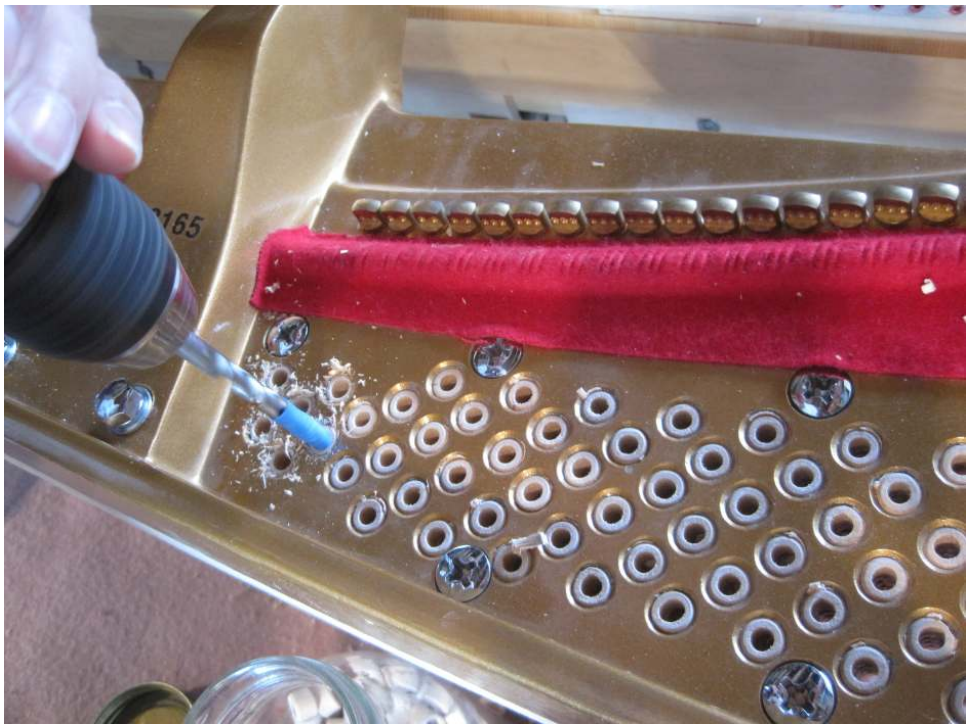

Photo 89: Each bushing is reamed to allow for the tuning pins.

Photo 90: The underside of the pinblock is supported where the first pins will be installed in the tenor section of the piano.

Photo 91: Size 2/0 (factory size) of nickel plated, blued pins.

Photo 92: String of each size comes in one pound reels.

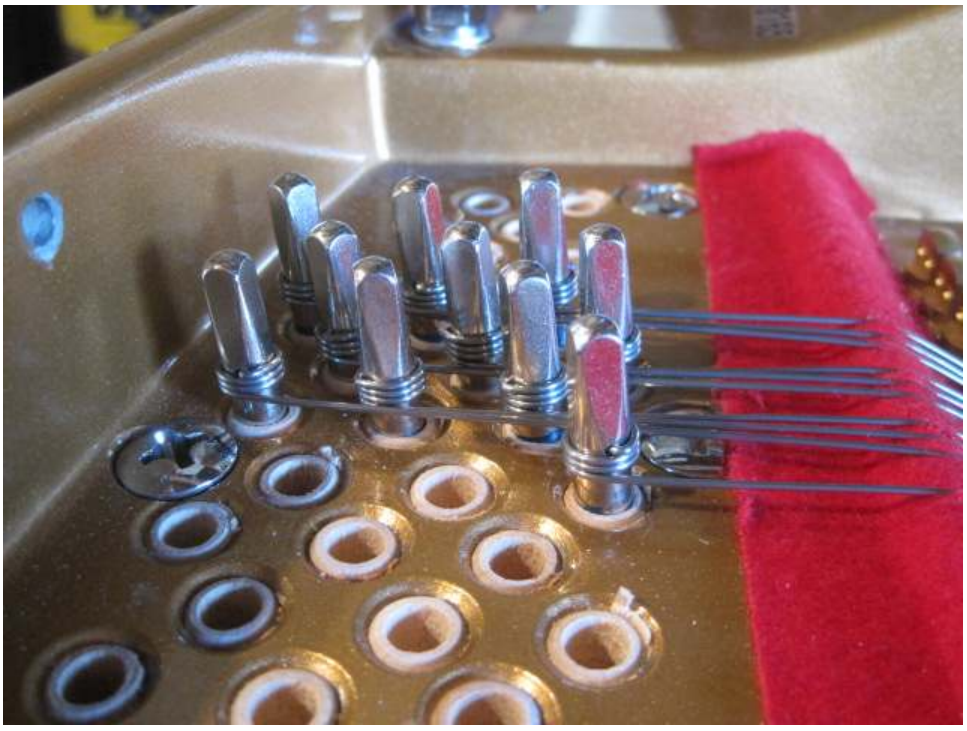

Photo 93: At last, strings start to go back into the piano.